SUPPLIER'S DECLARATION OF CONFORMITY

ATTESTATION

The Product has been tested and found compliance with the requirement of 47 CFR of PART 15 limit for radiation and conduction emission.

Based on the following criteria and procedures, product complies with FCC rules conformity assessment.

Certificate's Holder	:	Granbo Technology Industrial Shenzhen Co., Ltd.
Address	:	A, 17th Floor, S&T Building, Quanzhi Technology Innovation Park, Industrial Building, Maozhoushan Industrial Park, Houting Community, Shajing Street, Baoan District, Shenzhen, China
Manufacturer	:	Granbo Technology Industrial Shenzhen Co., Ltd.
Address	:	A, 17th Floor, S&T Building, Quanzhi Technology Innovation Park, Industrial Building, Maozhoushan Industrial Park, Houting Community, Shajing Street, Baoan District, Shenzhen, China
Product Name	:	Ultrasonic Cleaner
Product Model (S)	:	GC01, GC01M, GC01U, GC01BM, GC01BU, BK-01, BK-02, BK-03, BK-04, BK-05, BK-06, BK-07, BK-08, BK-09, BK-10
Trade Mark	:	N/A
Procedure	:	ANSI C63.4:2019
Related Standards	:	FCC Part 15 Subpart B
Certificate Number	:	HK2503141195E
Report No.	:	HK2503141195-1ER
Registration Date	:	Mar. 25, 2025

Jason Zhou

Certification Manager

The information of the certificate can be checked through www.cer-mark.com. The FCC mark which is shown on the certificate can only be used under the conditions that the products complete with all of the relevant Procedure of SUPPLIER'S DECLARATION OF CONFORMITY. The Manufacturer should be responsible for the internal production control so that the products complied with the essential requirements of the above mentioned Procedure. Certificate holder must notify all changes to the original certification laboratory of HUAK.

Shenzhen HUAK Testing Technology Co., Ltd.

Add.: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Tel.:+86-755-2302 9901 Http:// www.cer-mark.com Postcode:518103 E-mail: service@cer-mark.com

FCC
TEST REPORT

Prepared for :

Granbo Technology Industrial Shenzhen Co., Ltd.

A, 17th Floor, S&T Building, Quanzhi Technology Innovation Park, Industrial Building, Maozhoushan Industrial Park, Houting Community, Shajing Street, Baoan District, Shenzhen, China

Product Name:	**Ultrasonic Cleaner**
Trade Mark:	**N/A**
Product Model (S):	**GC01, GC01M, GC01U, GC01BM, GC01BU, BK-01, BK-02, BK-03, BK-04, BK-05, BK-06, BK-07, BK-08, BK-09, BK-10**
Date of Test:	**Mar. 14, 2025 – Mar. 25, 2025**
Date of Report:	**Mar. 25, 2025**
Report Number:	**HK2503141195-1ER**

Prepared By :

Shenzhen HUAK Testing Technology Co., Ltd.

1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

TEL: +86-755-2302 9901 FAX: +86-755-2302 9901

E-mail: service@cer-mark.com http://www.cer-mark.com

TEST REPORT VERIFICATION

Applicant	:	Granbo Technology Industrial Shenzhen Co., Ltd.
Address	:	A, 17th Floor, S&T Building, Quanzhi Technology Innovation Park, Industrial Building, Maozhoushan Industrial Park, Houting Community, Shajing Street, Baoan District, Shenzhen, China
Manufacturer	:	Granbo Technology Industrial Shenzhen Co., Ltd.
Address	:	A, 17th Floor, S&T Building, Quanzhi Technology Innovation Park, Industrial Building, Maozhoushan Industrial Park, Houting Community, Shajing Street, Baoan District, Shenzhen, China
Product Name	:	Ultrasonic Cleaner
(A) Product Model	:	GC01
(B) Series Model	:	GC01M, GC01U, GC01BM, GC01BU, BK-01, BK-02, BK-03, BK-04, BK-05, BK-06, BK-07, BK-08, BK-09, BK-10
(C) Power Supply	:	DC 12V From Adapter with AC 100-240V, 50/60Hz

Standards ..... FCC Part 15 Subpart B
ANSI C63.4:2019

This device described above has been tested by HUAK, and the test results show that the equipment under test (EUT) is in compliance with Part 15 of FCC Rules. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of HUAK, this document may be altered or revised by HUAK, personal only, and shall be noted in the revision of the document.

Test Result ..... **Pass**

Date of Test: Mar. 14, 2025 – Mar. 25, 2025

Prepared by: Kevin Pan
Project Engineer

Reviewed by: Silver Wan
Project Supervisor

Approved by: Jason Zhou
Technical Director

** Modified History **

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	2025/03/25	Jason Zhou

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
FCC Part 15 Subpart B ANSI C63.4:2019	Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	PASS	

NOTE:

(1) 'N/A' denotes test is not applicable in this Test Report

(2) For client's request and manual description, the test will not be executed.

1.1 TEST FACILITY

Shenzhen HUAK Testing Technology Co., Ltd.
Add. : 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Testing Laboratory Authorization：
A2LA Accreditation Code is 4781.01.
FCC Designation Number is CN1229.
Canada IC CAB identifier is CN0045.
CNAS Registration Number is L9589.

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U** , where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2** , providing a level of confidence of approximately **95** %.

A. Conducted Measurement :

Measurement Frequency Range	Uncertainty	NOTE
150 KHz ~ 30MHz	±2.71dB	

B. Radiated Measurement :

Measurement Frequency Range	Uncertainty	NOTE
30MHz ~ 1000MHz	±3.90dB	
1GHz ~6GHz	±4.28dB	

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product Name	Ultrasonic Cleaner
Product Model	GC01
Series Model	GC01M, GC01U, GC01BM, GC01BU, BK-01, BK-02, BK-03, BK-04, BK-05, BK-06, BK-07, BK-08, BK-09, BK-10
Model Difference	All model's the function, software and electric circuit are the same, only with a product color and model named different. Test sample model: GC01.
Product Description	The EUT is a Ultrasonic Cleaner. Operating frequency: N/A Connecting I/O port: N/A Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.
Power Source	DC Voltage
Power Rating	DC 12V From Adapter with AC 100-240V, 50/60Hz

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

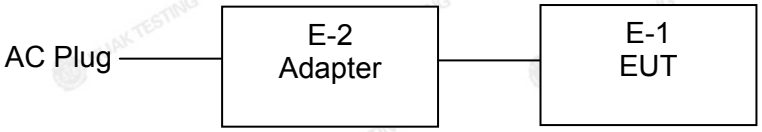
Pretest Mode	Description
Mode 1	Working

For Conducted Test	
Final Test Mode	Description
Mode 1	Working

For Radiated Test	
Final Test Mode	Description
Mode 1	Working

2.3 DESCRIPTION OF TEST SETUP

Mode 1:



2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Trade Mark	Model/Type No.	Series No.	Note
E-1	Ultrasonic Cleaner	N/A	GC01	N/A	EUT
E-2	Adapter	N/A	D241U-120200	N/A	

Item	Shielded Type	Ferrite Core	Length	Note

Note:

(1) The support equipment was authorized by Declaration of Confirmation.

(2) For detachable type I/O cable should be specified the length in cm in『Length』column.

(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.5 MEASUREMENT INSTRUMENTS LIST

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N.	R&S	ENV216	HKE-002	Feb. 19, 2025	1 Year
2.	L.I.S.N.	R&S	ENV216	HKE-059	Feb. 19, 2025	1 Year
3.	EMI Test Receiver	R&S	ESR	HKE-005	Feb. 19, 2025	1 Year
4.	Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 19, 2025	1 Year
5.	Spectrum analyzer	R&S	FSV3044	HKE-126	Feb. 19, 2025	1 Year
6.	Preamplifier	EMCI	EMC051845S	HKE-006	Feb. 19, 2025	1 Year
7.	Preamplifier	Schwarzbeck	BBV 9743	HKE-016	Feb. 19, 2025	1 Year
8.	Preamplifier	A.H. Systems	SAS-574	HKE-182	Feb. 19, 2025	1 Year
9.	6d Attenuator	Pasternack	6db	HKE-184	Feb. 19, 2025	1 Year
10.	EMI Test Receiver	Rohde & Schwarz	ESR-7	HKE-010	Feb. 19, 2025	1 Year
11.	Broadband Antenna	Schwarzbeck	VULB9168	HKE-167	Feb. 21, 2024	2 Year
12.	Loop Antenna	COM-POWER	AL-130R	HKE-014	Feb. 21, 2024	2 Year
13.	Horn Antenna	Schewarzbeck	9120D	HKE-013	Feb. 21, 2024	2 Year
14.	EMI Test Software	Tonscend	JS32-CE 2.5.0.6	HKE-081	/	/
15.	EMI Test Software	Tonscend	JS32-RE 5.0.0	HKE-082	/	/

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

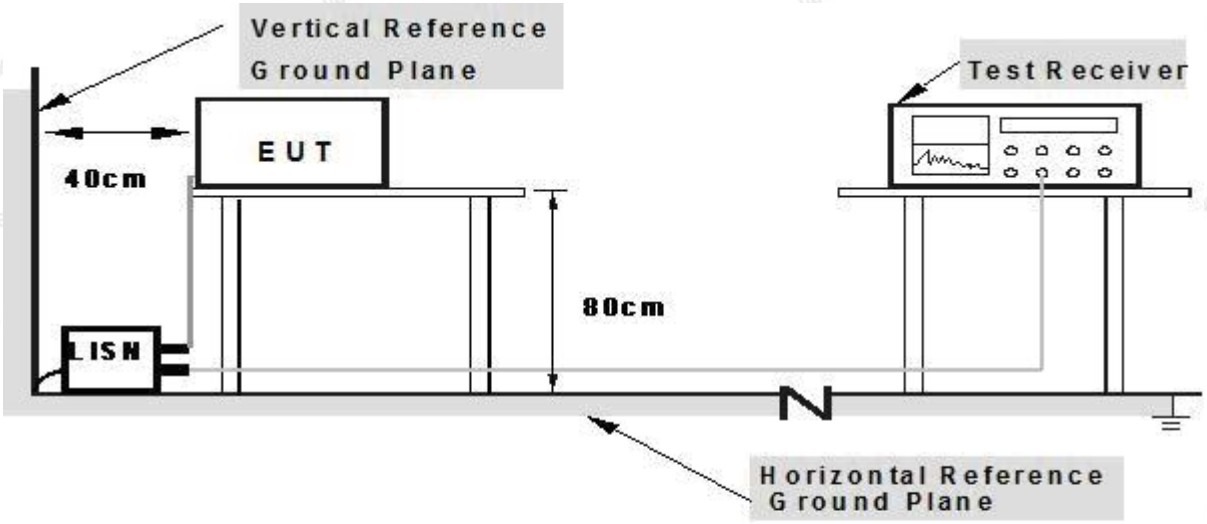
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.4 EUT OPERATING CONDITIONS

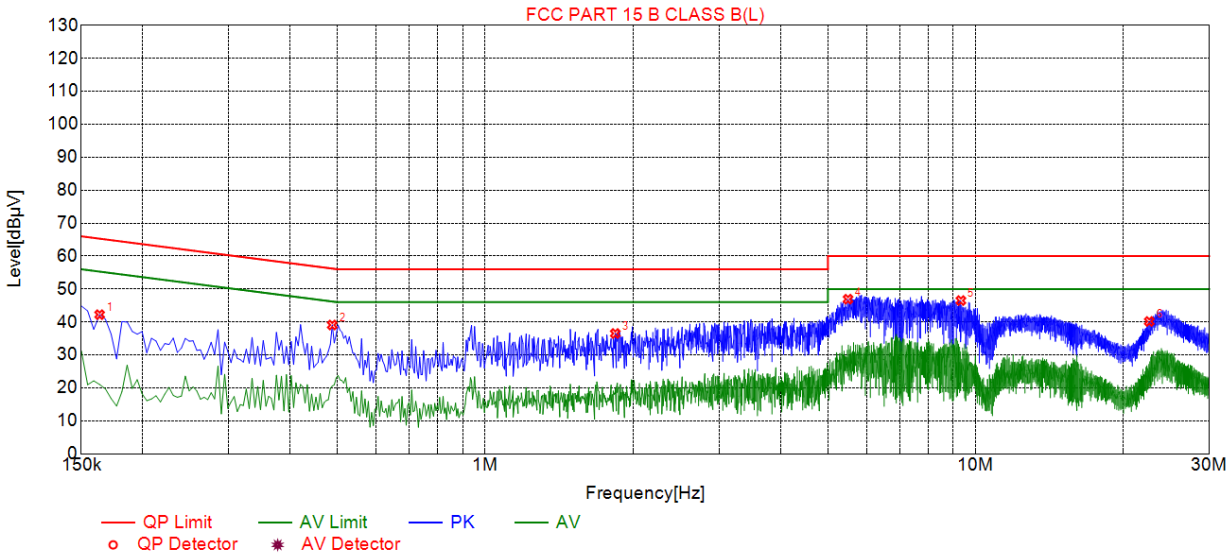
The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.1.5 TEST RESULTS

Note:

All the test modes completed for test. only the worst result of was reported.

EUT :	Ultrasonic Cleaner	Model Name. :	GC01
Temperature :	24 ℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2025-03-24
Test Mode :	Mode 1	Polarization :	L
Test Voltage :	DC 12V From Adapter		



Suspected List

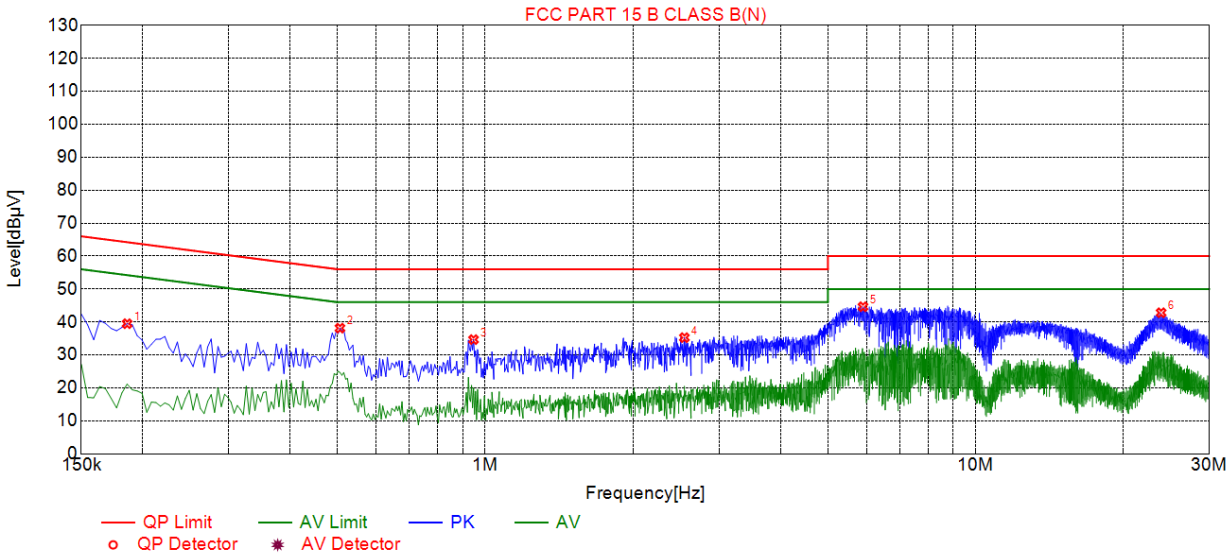
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.1635	42.22	19.78	65.28	23.06	22.44	PK	L
2	0.4875	39.08	19.84	56.21	17.13	19.24	PK	L
3	1.8420	36.51	19.96	56.00	19.49	16.55	PK	L
4	5.4960	46.93	20.11	60.00	13.07	26.82	PK	L
5	9.3390	46.50	19.99	60.00	13.50	26.51	PK	L
6	22.6230	40.16	20.03	60.00	19.84	20.13	PK	L

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

EUT :	Ultrasonic Cleaner	Model Name. :	GC01
Temperature :	24 ℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2025-03-24
Test Mode :	Mode 1	Polarization :	N
Test Voltage :	DC 12V From Adapter		



Suspected List

NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.1860	39.48	19.74	64.21	24.73	19.74	PK	N
2	0.5055	38.13	19.73	56.00	17.87	18.40	PK	N
3	0.9465	34.65	19.74	56.00	21.35	14.91	PK	N
4	2.5485	35.25	19.90	56.00	20.75	15.35	PK	N
5	5.8965	44.63	19.99	60.00	15.37	24.64	PK	N
6	23.9190	42.80	20.19	60.00	17.20	22.61	PK	N

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 3m)
	dBuV/m	dBuV/m
30 ~ 88	39.0	40.0
88 ~ 216	43.5	43.5
216 ~ 960	46.5	46.0
Above 960	49.5	54.0

Notes:

(1) The limit for radiated test was performed according to as following: FCC PART 15B /ICES-003.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2.2 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.

b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

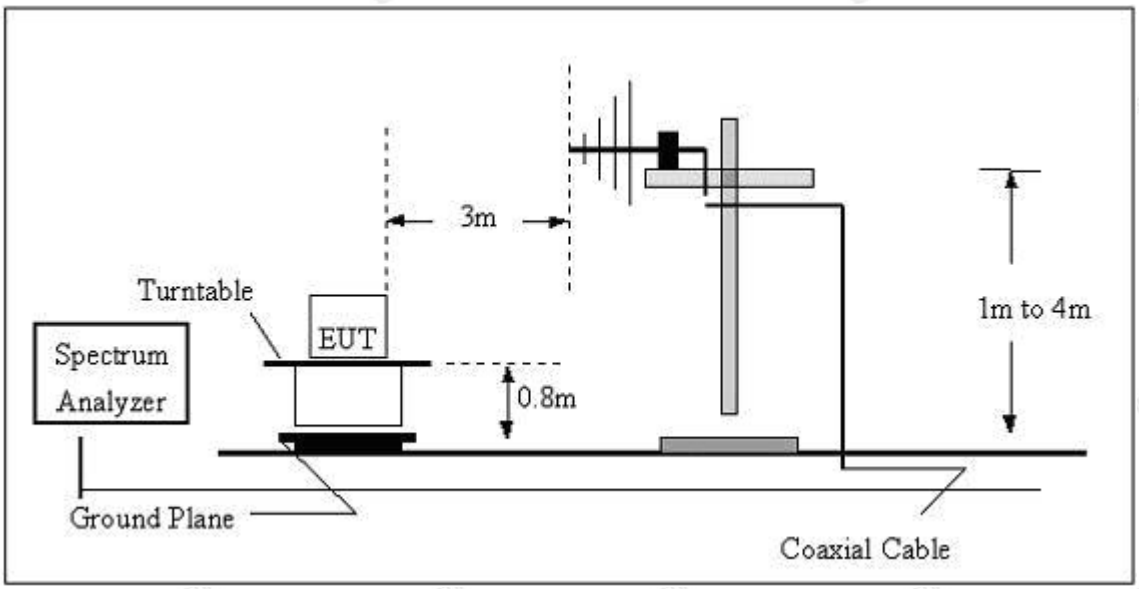
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured, above 1G Average detector mode will be instead.

e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP(AV) Limits and then no additional QP Mode measurement performed.

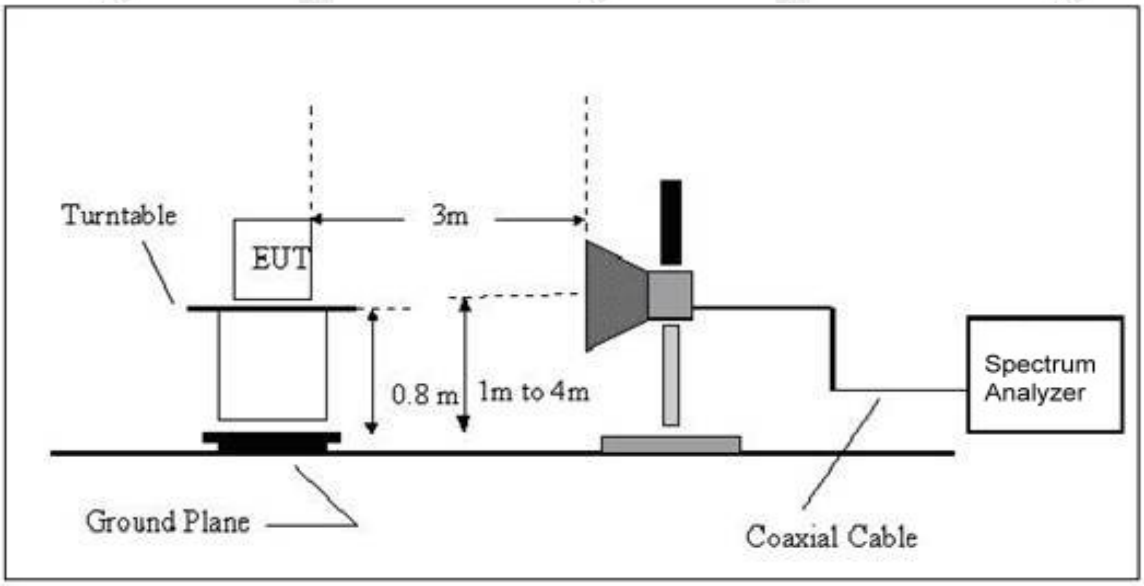
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.2.3 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Radiated Emission Test Set-Up Frequency Above 1GHz

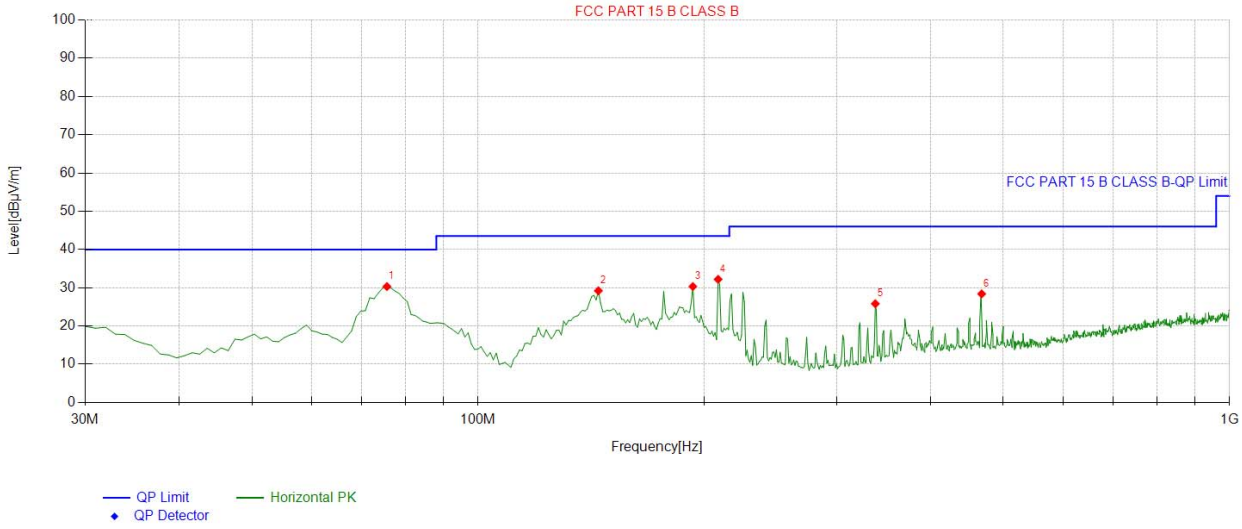


3.2.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.5 TEST RESULTS

EUT :	Ultrasonic Cleaner	Model Name :	GC01
Temperature :	24 ℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2025-03-24
Test Mode :	Mode 1	Polarization :	Horizontal
Test Power :	DC 12V From Adapter		



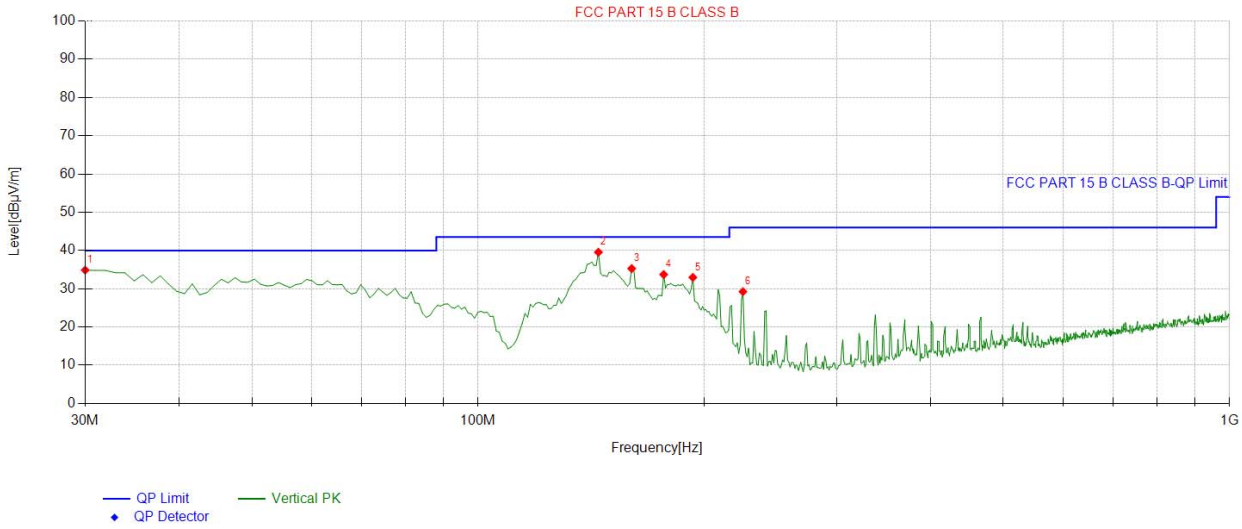
Suspected List

NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	75.635636	-20.45	50.76	30.31	40.00	9.69	100	212	Horizontal
2	144.57457	-17.70	46.91	29.21	43.50	14.29	100	307	Horizontal
3	193.12312	-20.38	50.70	30.32	43.50	13.18	100	298	Horizontal
4	208.65865	-20.96	53.16	32.20	43.50	11.30	100	276	Horizontal
5	337.79779	-16.75	42.56	25.81	46.00	20.19	100	173	Horizontal
6	467.90790	-13.59	41.98	28.39	46.00	17.61	100	101	Horizontal

Final Data List

Remark: Factor = Cable loss + Antenna factor – Preamplifier; Level = Reading + Factor; Margin = Limit – Level;

EUT :	Ultrasonic Cleaner	Model Name :	GC01
Temperature :	24 ℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2025-03-24
Test Mode :	Mode 1	Polarization :	Vertical
Test Power :	DC 12V From Adapter		



Suspected List

NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	30	-18.17	53.04	34.87	40.00	5.13	100	0	Vertical
2	144.57457	-17.70	57.24	39.54	43.50	3.96	100	191	Vertical
3	160.11011	-17.16	52.44	35.28	43.50	8.22	100	99	Vertical
4	176.61661	-18.50	52.22	33.72	43.50	9.78	100	55	Vertical
5	193.12312	-20.38	53.33	32.95	43.50	10.55	100	99	Vertical
6	225.16516	-20.63	49.87	29.24	46.00	16.76	100	31	Vertical

Final Data List

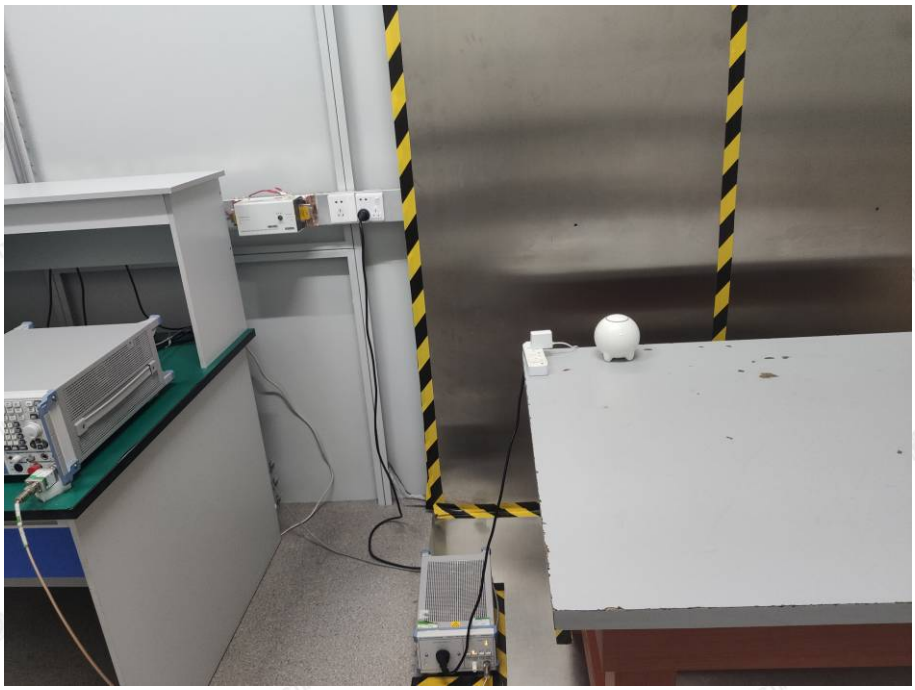
Remark: Factor = Cable loss + Antenna factor – Preamplifier; Level = Reading + Factor; Margin = Limit – Level;

3.2.6 TEST RESULTS(Above 1GHz)

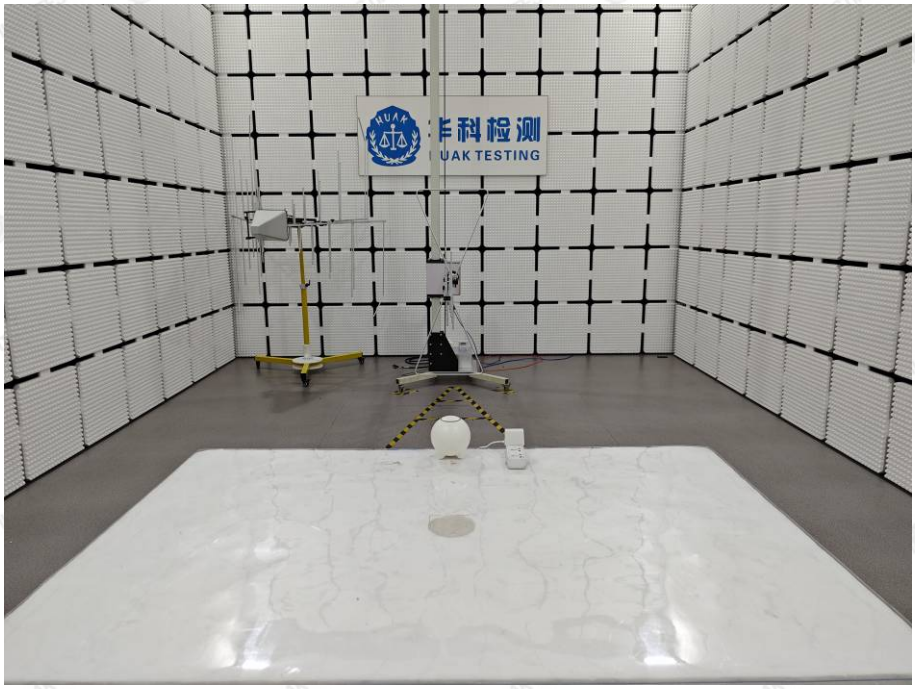
EUT :	Ultrasonic Cleaner	Model Name :	GC01
Temperature :	N/A	Relative Humidity :	N/A
Pressure :	N/A	Test Date :	N/A
Test Mode :	N/A		
Test Power :	N/A		
Note: EUT high frequency is less than 108MHz, so this test report is not applicable.			

4. EUT TEST PHOTO

Conducted Emission



Radiated Emission



ATTACHMENT PHOTOGRAPHS OF EUT

Photo 1

Photo 2

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Photo 3

Photo 4

Photo 5

Photo 6

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Photo 7

Photo 8

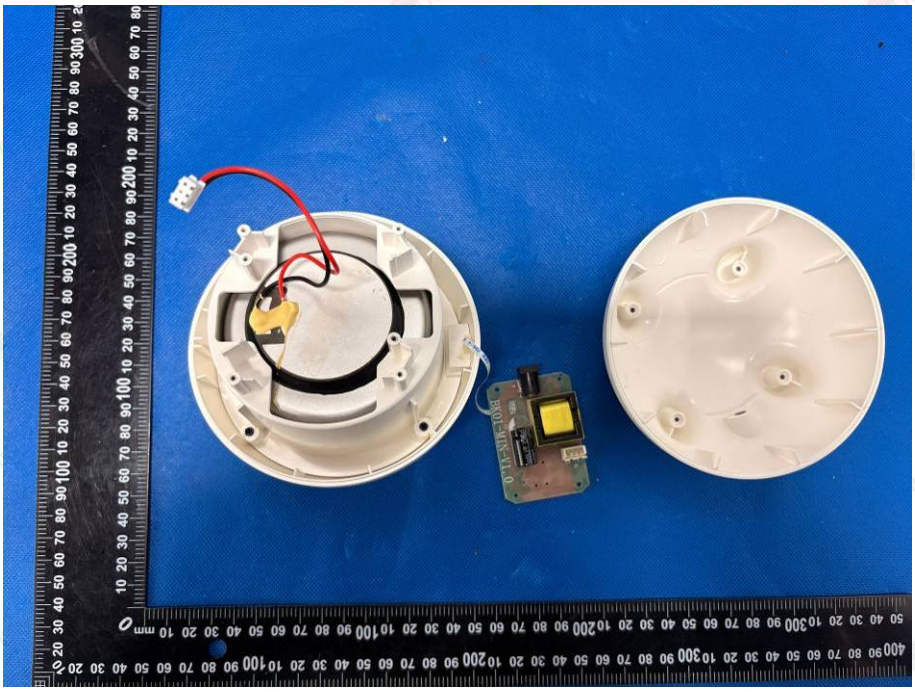


Photo 9

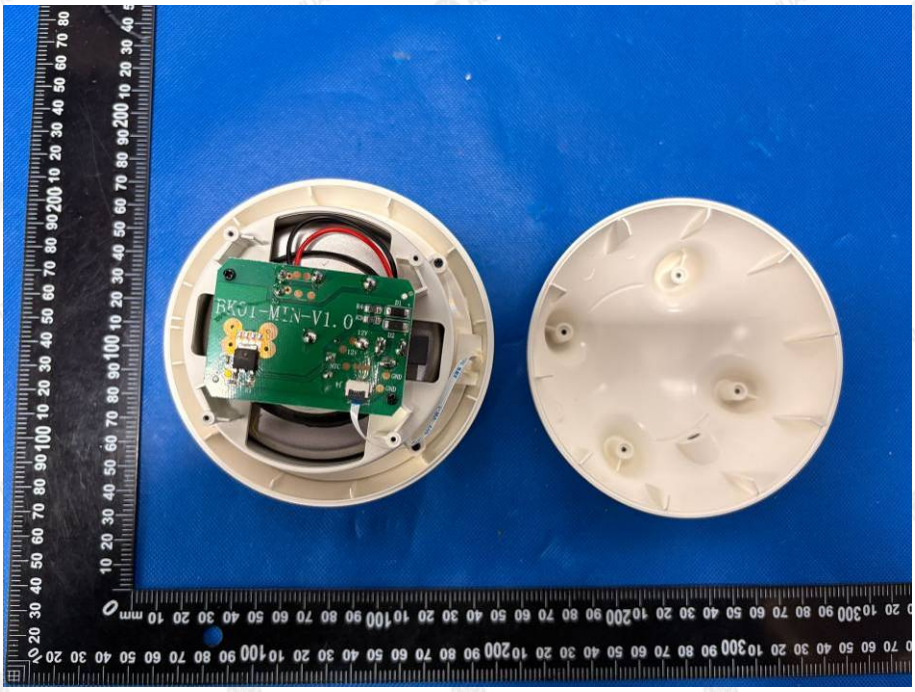
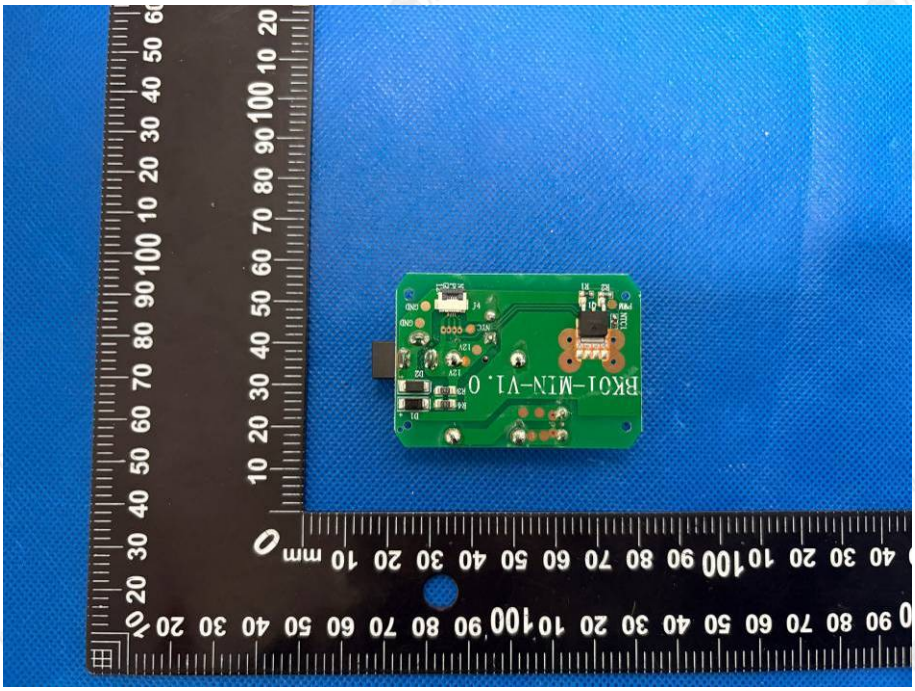
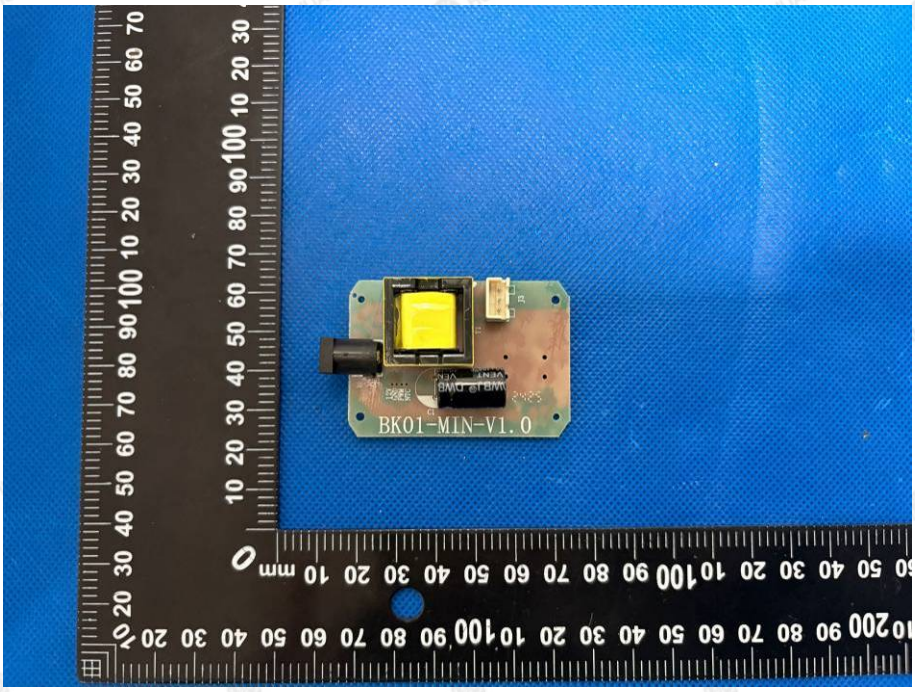


Photo 10



TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Photo 11



----------End of report----------

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

This certificate is responsible for testing sample only.
Please refer to this corresponding test report to get testing process and data.

CERTIFICATE

ATTESTATION
Certificate of Compliance

Technical file of the company mentioned below has been inspected and audit has been completed successfully

The EMC Directive 2014/30/EU has been taken as references for these processes.

Certificate's Holder	:	Granbo Technology Industrial Shenzhen Co., Ltd.
Address	:	A, 17th Floor, S&T Building, Quanzhi Technology Innovation Park, Industrial Building, Maozhoushan Industrial Park, Houting Community, Shajing Street, Baoan District, Shenzhen, China
Manufacturer	:	Granbo Technology Industrial Shenzhen Co., Ltd.
Address	:	A, 17th Floor, S&T Building, Quanzhi Technology Innovation Park, Industrial Building, Maozhoushan Industrial Park, Houting Community, Shajing Street, Baoan District, Shenzhen, China
Product Name	:	Ultrasonic Cleaner
Product Model (S)	:	GC01, GC01M, GC01U, GC01BM, GC01BU, BK-01, BK-02, BK-03, BK-04, BK-05, BK-06, BK-07, BK-08, BK-09, BK-10
Trade Mark	:	N/A
Related Directive	:	2014/30/EU
Related Standards	:	EN IEC 55014-1:2021 EN IEC 61000-3-2:2019 + A1:2021 + A2:2024 EN 61000-3-3:2013 + A1:2019 + A2:2021 EN IEC 55014-2:2021
Certificate Number	:	HK2503141194E
Report No.	:	HK2503141194-1ER
Registration Date	:	Mar. 25, 2025

Jason Zhou

Certification Manager

The information of the certificate can be checked through www.cer-mark.com. The CE mark which is shown on the certificate can only be used under the conditions that the products complete with all of the relevant Directives of CE Declaration of Conformity. The Manufacturer should be responsible for the internal production control so that the products complied with the essential requirements of the above mentioned Directive(s). Certificate holder must notify all changes to the original certification laboratory of HUAK.

CE

Shenzhen HUAK Testing Technology Co., Ltd.

Add.: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Tel.:+86-755-2302 9901 Http:// www.cer-mark.com Postcode:518103 E-mail: service@cer-mark.com

CE-EMC
TEST REPORT

Prepared for :

Granbo Technology Industrial Shenzhen Co., Ltd.

A, 17th Floor, S&T Building, Quanzhi Technology Innovation Park, Industrial Building, Maozhoushan Industrial Park, Houting Community, Shajing Street, Baoan District, Shenzhen, China

Product Name:	**Ultrasonic Cleaner**
Trade Mark:	**N/A**
Product Model (S):	**GC01, GC01M, GC01U, GC01BM, GC01BU, BK-01, BK-02, BK-03, BK-04, BK-05, BK-06, BK-07, BK-08, BK-09, BK-10**
Date of Test:	**Mar. 14, 2025 – Mar. 25, 2025**
Date of Report:	**Mar. 25, 2025**
Report Number:	**HK2503141194-1ER**

Prepared By :

Shenzhen HUAK Testing Technology Co., Ltd.

1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

TEL: +86-755-2302 9901 FAX: +86-755-2302 9901

E-mail: service@cer-mark.com http://www.cer-mark.com

TEST REPORT VERIFICATION

Applicant	:	Granbo Technology Industrial Shenzhen Co., Ltd.
Address	:	A, 17th Floor, S&T Building, Quanzhi Technology Innovation Park, Industrial Building, Maozhoushan Industrial Park, Houting Community, Shajing Street, Baoan District, Shenzhen, China
Manufacturer	:	Granbo Technology Industrial Shenzhen Co., Ltd.
Address	:	A, 17th Floor, S&T Building, Quanzhi Technology Innovation Park, Industrial Building, Maozhoushan Industrial Park, Houting Community, Shajing Street, Baoan District, Shenzhen, China
Product Name	:	Ultrasonic Cleaner
(A) Product Model	:	GC01
(B) Series Model	:	GC01M, GC01U, GC01BM, GC01BU, BK-01, BK-02, BK-03, BK-04, BK-05, BK-06, BK-07, BK-08, BK-09, BK-10
(C) Power Supply	:	DC 12V From Adapter with AC 100-240V, 50/60Hz

Standards..... EN IEC 55014-1:2021
EN IEC 61000-3-2:2019 + A1:2021 + A2: 2024
EN 61000-3-3:2013 + A1:2019 + A2:2021
EN IEC 55014-2:2021

This device described above has been tested by HUAK, and the test results show that the equipment under test (EUT) is in compliance with the 2014/30/EU requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of HUAK, this document may be altered or revised by HUAK, personal only, and shall be noted in the revision of the document.

Test Result..... **Pass**

Date of Test: Mar. 14, 2025 – Mar. 25, 2025

Prepared by: Kevin Pan
Project Engineer

Reviewed by: Sliver Wan
Project Supervisor

Approved by: Jason Zhou
Technical Director

Table of Contents **Page**

Table of Contents **Page**

** Modified History **

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	2025/03/25	Jason Zhou

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
EN IEC 55014-1	Conducted Emission	Clause 4.3.3.6	PASS	
	Disturbance Power	Clause 4.3.4.4	PASS	
	Radiated Emission	Clause 4.3.4.5	N/A	
EN IEC 61000-3-2	Harmonic Current Emission	Class A	N/A NOTE (5)	
EN 61000-3-3	Voltage Fluctuations & Flicker	------	PASS	
EMC Immunity				
Section EN IEC 55014-2	Test Item	Performance Criteria	Judgment	Remark
EN 61000-4-2	Electrostatic Discharge	B	PASS	
EN IEC 61000-4-3	RF electromagnetic field	A	N/A NOTE (4)	
EN 61000-4-4	Fast transients	B	PASS	
EN 61000-4-5	Surges	B	PASS	
EN 61000-4-6	Injected Current	A	PASS	
EN IEC 61000-4-11	Volt. Interruptions Volt. Dips	C / C / C NOTE (2)	PASS	

NOTE:

(1)" N/A" denotes test is not applicable in this Test Report

(2) Voltage dip: 0% – Performance Criteria **C**
Voltage dip: 40% – Performance Criteria **C**
Voltage dip: 70% – Performance Criteria **C**

(3) For client's request and manual description, the test will not be executed.

(4) EUT belong Category II.

(5) EUT Power is less than 75W.

1.1 TEST FACILITY

Shenzhen HUAK Testing Technology Co., Ltd.
Address: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Testing Laboratory Authorization :
A2LA Accreditation Code is 4781.01.
FCC Designation Number is CN1229.
Canada IC CAB identifier is CN0045.
CNAS Registration Number is L9589.

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y** ± **U** , where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2** , providing a level of confidence of approximately **95** %。

A. Conducted Measurement :

Measurement Frequency Range	Uncertainty	NOTE
150 KHz ~ 30MHz	±2.71dB	

B. Radiated Measurement :

Measurement Frequency Range	Uncertainty	NOTE
30MHz ~ 1000MHz	±3.90dB	
1GHz ~6GHz	±4.28dB	

C. Disturbance Power Measurement:

Measurement Frequency Range	Uncertainty	NOTE
30MHz ~300MHz	±3.35dB	

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product Name	Ultrasonic Cleaner
Product Model	GC01
Series Model	GC01M, GC01U, GC01BM, GC01BU, BK-01, BK-02, BK-03, BK-04, BK-05, BK-06, BK-07, BK-08, BK-09, BK-10
Model Difference	All model's the function, software and electric circuit are the same, only with a product color and model named different. Test sample model: GC01.
Product Description	The EUT is a Ultrasonic Cleaner. Operating frequency: N/A Connecting I/O port: N/A Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.
Power Source	DC Voltage
Power Rating	DC 12V From Adapter with AC 100-240V, 50/60Hz

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Working

For Conducted Test	
Final Test Mode	Description
Mode 1	Working

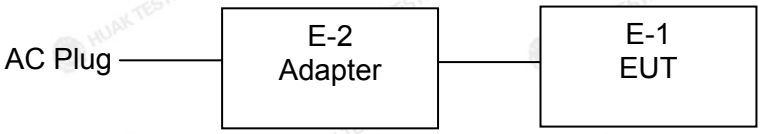
For Disturbance Power Test	
Final Test Mode	Description
Mode 1	Working

For Radiated Test	
Final Test Mode	Description
Mode 1	N/A

For EMS Test	
Final Test Mode	Description
Mode 1	Working

2.3 DESCRIPTION OF TEST SETUP

Mode 1:



2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Trade Mark	Model/Type No.	Series No.	Note
E-1	Ultrasonic Cleaner	N/A	GC01	N/A	EUT
E-2	Adapter	N/A	D241U-120200	N/A	

Item	Shielded Type	Ferrite Core	Length	Note

Note:

(1) The support equipment was authorized by Declaration of Confirmation.

(2) For detachable type I/O cable should be specified the length in cm in『Length』column.

(3) “YES” is means “shielded” “with core”; “NO” is means “unshielded” “without core”.

2.5 MEASUREMENT INSTRUMENTS LIST

2.5.1 CONDUCTED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	R&S	ENV216	HKE-002	Feb. 18, 2026
2	LISN	R&S	ENV216	HKE-059	Feb. 18, 2026
3	EMI Test Receiver	R&S	ESR	HKE-005	Feb. 18, 2026
4	ISN	ETC	08-06-BAC-022-02	HKE-062	Feb. 18, 2026
5	Conduction test software	Tonscend	JS32-CE 2.5.0.6	HKE-081	/

2.5.2 RADIATED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Broadband antenna	Schwarzbeck	VULB 9163	HKE-012	Feb. 20, 2026
2	Horn antenna	Schwarzbeck	9120D	HKE-013	Feb. 20, 2026
3	EMI Test Receiver	R&S	ESR-7	HKE-010	Feb. 18, 2026
4	Spectrum Analyzer	Agilent	N9020A	HKE-048	Feb. 18, 2026
5	Amplifier	Schwarzbeck	EMC051845 SE	HKE-015	Feb. 18, 2026
6	Amplifier	Agilent	83051A	HKE-016	Feb. 18, 2026
7	Radiated test software	Tonscend	JS32-RE 5.0.0	HKE-082	/

2.5.3 Disturbance Power TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EMI Test Receiver	R&S	ESR	HKE-005	Feb. 18, 2026
2	6DB Attenuator	Pasternack	6db	HKE-007	Feb. 18, 2026
3	Electromagnetic absorbing clamp	R&S	MDS 21	HKE-008	Feb. 18, 2026

2.5.4 HARMONICS AND FILCK

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Harmonic flicker tester	California Instruments	AC2000A	HKE-037	Feb. 18, 2026

2.5.5 ESD

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	ESD device	TESEQ	NSG437	HKE-023	Feb. 18, 2026

2.5.6 RS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power amplifier	micotop	MPA-80-1000-250	HKE-142	Feb. 18, 2026
2	Power amplifier	micotop	MPA-1000-6000-100	HKE-143	Feb. 18, 2026
3	Power Meter	KEYSIGHT	E4419B	HKE-144	Feb. 18, 2026
4	Signal Generator	Agilent	N5181A	HKE-145	Feb. 18, 2026
5	Field intensity probe	NARDA	EP601	HKE-146	Feb. 18, 2026
6	High gain antenna	Schwarzbeck	STPL9129	HKE-147	Feb. 18, 2026
7	RS Test Software	Tonscend	JS35-RS 5.0.0	HKE-186	/

2.5.7 SURGE, EFT/BURST, VOLTAGE INTERRUPTION/DIPS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Full-featured immunity tester	TESEQ	NSG3060	HKE-036	Feb. 18, 2026
2	Pulse coupling clamp	TESEQ	CDN 8014	HKE-024	Feb. 18, 2026

2.5.8 INJECTION CURRENT

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Magnetic clamp	TESEQ	KEMA 801	HKE-114	Feb. 18, 2026
2	Integrated Conduction Sensitivity Test System	SCHLODER	CDG6000	HKE-033	Feb. 18, 2026
3	Coupling decoupling network	TESEQ	CDN-M2+M3	HKE-032	Feb. 18, 2026

2.5.9 MF

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Power frequency induction coil	LIONCEL	PMF-801C-C	HKE-049	Feb. 18, 2026

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

Frequency Range (MHz)	At mains terminals	
	Quasi-peak (dBuV)	Average (dBuV)
0.15 -0.5	66 - 56 *	59 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

3.1.2 MAINS TERMINALS OF TOOLS

Frequency Range	Rated motor power not exceeding 700W		Rated motor power above 700W and not exceeding1 000 W		Rated motor power above 1 000 W	
(MHz)	dB (uV) Quasi-peak	dB (uV) Average**	dB (uV) Quasi-peak	dB (uV) Average**	dB (uV) Quasi-peak	dB (uV) Average**
0.15 -0.5	66.0 to 59.0*	59.0 to 49.0*	70.0 to 63.0*	63.0 to 53.0*	76.0 to 69.0*	69.0 to 59.0*
0.50 -5.0	59.0	49.0	63.0	53.0	69.0	59.0
5.0 -30.0	64.0	54.0	68.0	58.0	74.0	64.0

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

(3) "**" If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.

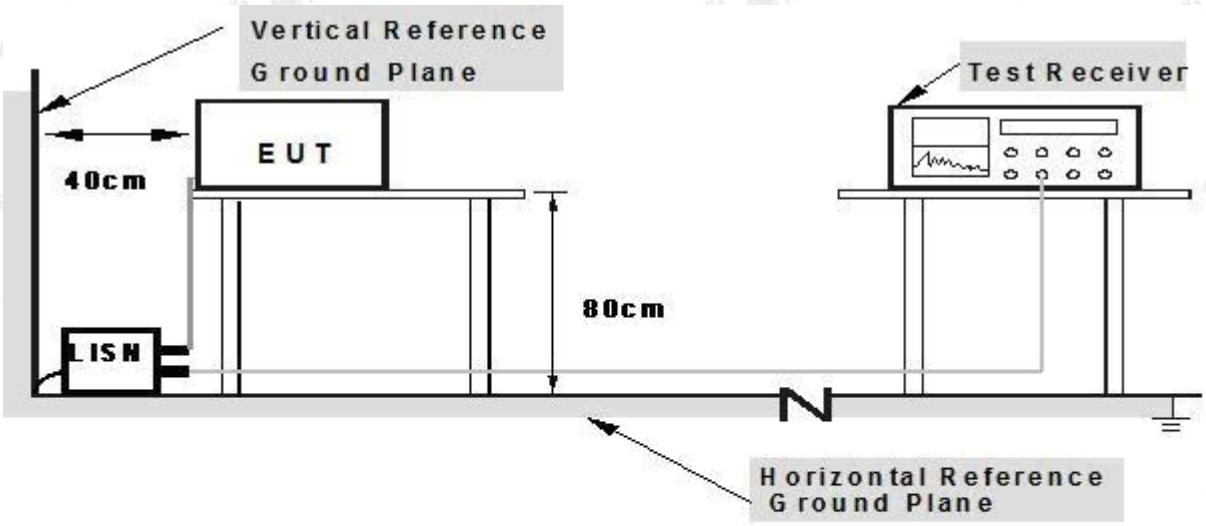
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.3 TEST PROCEDURE

a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.4 TEST SETUP



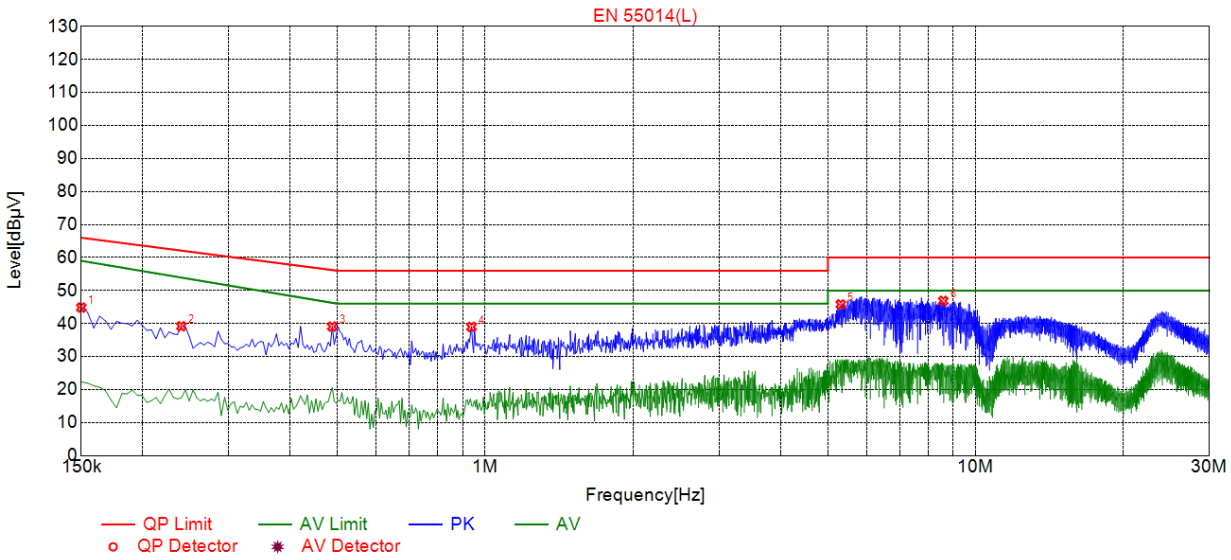
Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.1.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.1.6 TEST RESULTS

EUT：	Ultrasonic Cleaner	Model Name：	GC01
Temperature：	24 ℃	Relative Humidity：	54%
Pressure：	1010hPa	Test Date：	2025-03-24
Test Mode：	Mode 1	Phase：	L
Test Voltage ：	DC 12V From Adapter		



Suspected List

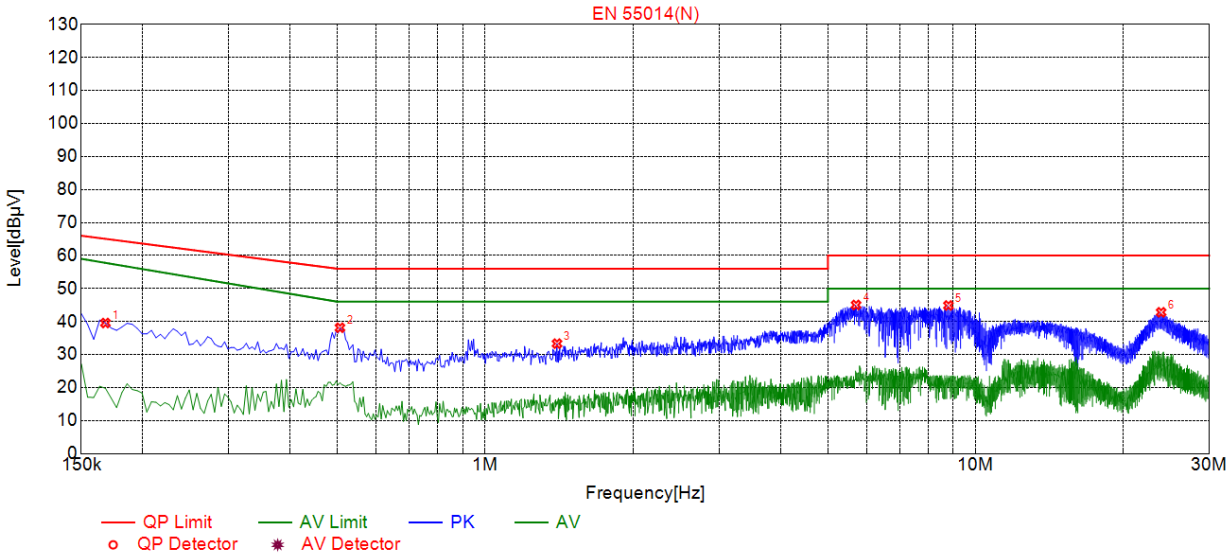
NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.1500	44.85	19.83	66.00	21.15	25.02	PK	L
2	0.2400	39.18	19.83	62.10	22.92	19.35	PK	L
3	0.4875	39.08	19.84	56.21	17.13	19.24	PK	L
4	0.9375	38.98	19.87	56.00	17.02	19.11	PK	L
5	5.3115	45.81	20.11	60.00	14.19	25.70	PK	L
6	8.5965	46.87	20.01	60.00	13.13	26.86	PK	L

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

EUT :	Ultrasonic Cleaner	Model Name :	GC01
Temperature :	24 ℃	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2025-03-24
Test Mode :	Mode 1	Phase :	N
Test Voltage :	DC 12V From Adapter		



Suspected List

NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.1680	39.56	19.71	65.06	25.50	19.85	PK	N
2	0.5055	38.13	19.73	56.00	17.87	18.40	PK	N
3	1.4010	33.31	19.79	56.00	22.69	13.52	PK	N
4	5.7075	45.02	19.99	60.00	14.98	25.03	PK	N
5	8.8080	44.87	19.91	60.00	15.13	24.96	PK	N
6	23.9190	42.80	20.19	60.00	17.20	22.61	PK	N

Remark: Margin = Limit – Level

Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor

3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT (Below 1000MHz)

FREQUENCY (MHz)	At 10m	At 3m
	dBuV/m	dBuV/m
30 – 230	30	40
230 – 1000	37	47

3.2.2 LIMITS OF DISTURBANCE POWER MEASUREMENT (Below 1000MHz)

	Household and similar appliances		Tools			
Frequency Range			Rated motor power not exceeding 700 W		Rated motor power above 700 W and not exceeding 1 000 W	
(MHz)	dB (pW) Quasi-peak	dB (pW) Averag*	dB (pW) Quasi-peak	dB (pW) Averag*	dB (pW) Quasi-peak	dB (pW) Averag*
30-300	45-55	35-45	45-55	35-45	49-59	39-49

Notes:

(1) The limit for radiated test was performed according to as following: CISPR 14.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2.3 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.

b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

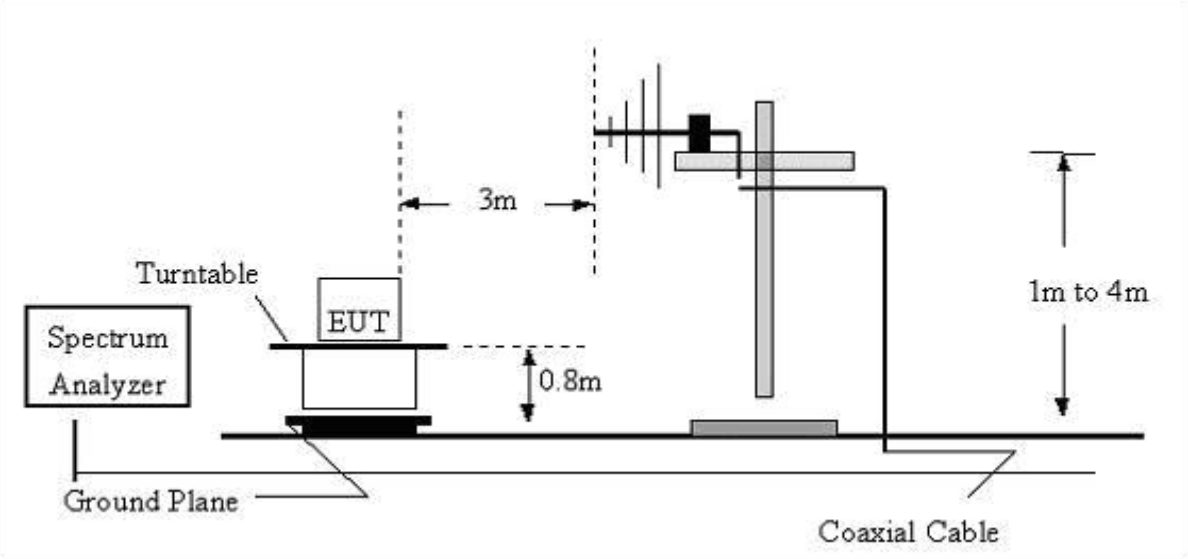
d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured, above 1G Average detector mode will be instead.

e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP(AV) Limits and then no additional QP Mode measurement performed.

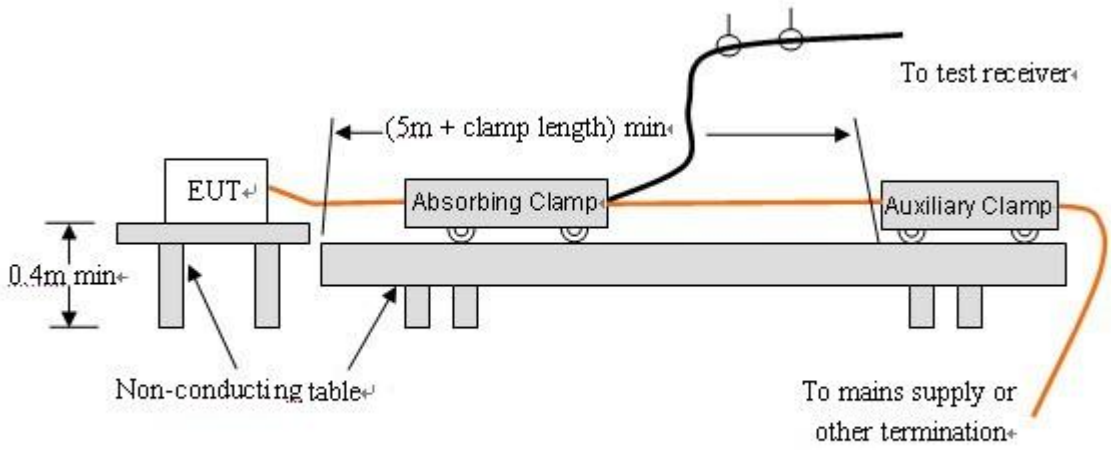
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.2.4 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Disturbance Power Test Set-UP Frequency Below 1GHz

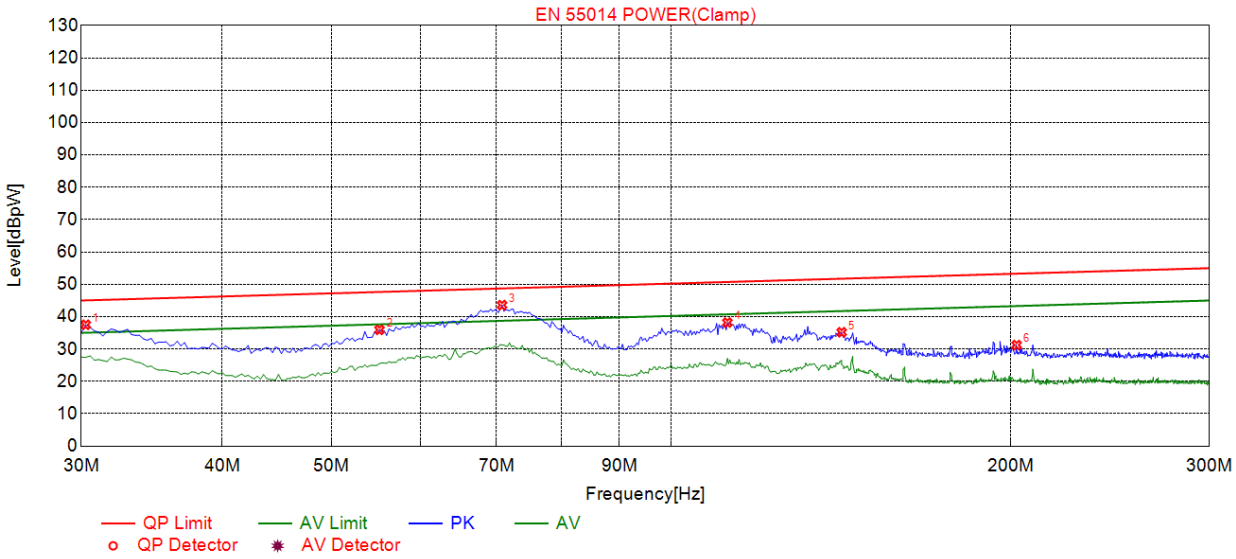


3.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.2.6 TEST RESULTS (30MHz ~300MHz)

EUT :	Ultrasonic Cleaner	Model Name :	GC01
Temperature :	24 ℃	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2025-03-24
Test Mode :	Mode 1		
Test Power :	DC 12V From Adapter		



Suspected List

NO.	Freq. [MHz]	Level[dBpw]	Factor [dB]	Reading [dBpW]	Limit [dBpw]	Margin [dB]	Detector	Type
1	30.2703	37.50	18.36	19.14	45.04	7.54	PK	Clamp
2	55.1351	35.94	16.21	19.73	47.64	11.70	PK	Clamp
3	70.8108	43.59	15.76	27.83	48.73	5.14	PK	Clamp
4	112.1622	38.18	15.98	22.20	50.73	12.55	PK	Clamp
5	141.6216	35.19	14.76	20.43	51.74	16.55	PK	Clamp
6	202.4324	31.24	14.45	16.79	53.29	22.05	PK	Clamp

Remark: Margin = Limit – Level

Correction factor = Cable lose + insertion loss

Level=Test receiver reading + correction factor

3.2.7 TEST RESULTS (30MHz-1000MHz)

EUT :	Ultrasonic Cleaner	Model Name :	GC01
Temperature :	N/A	Relative Humidity :	N/A
Pressure :	N/A	Test Date :	N/A
Test Mode :	N/A	Polarization :	N/A
Test Power :	N/A		

Note:

1) N/A - denotes test is not applicable in this test report
2) Disturbance power test result is less than limit 10dB
3) The maximum clock frequency is less than 30 MHz

3.2.8 TEST RESULTS (1000MHz-6000MHz)

EUT：	Ultrasonic Cleaner	Model Name ：	GC01
Temperature：	N/A	Relative Humidity：	N/A
Pressure：	N/A	Test Date：	N/A
Test Mode ：	N/A		
Test Power ：	N/A		
Note: EUT highest frequency is less than 108MHz, so this test report is not applicable.			

3.3 HARMONICS CURRENT

3.3.1 LIMITS OF HARMONICS CURRENT

IEC 555-2					
Table - I			Table - II		
Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in Ampers)	Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in Ampers)
Non Portable Tools or TV Receivers	Odd Harmonics		TV Receivers	Odd Harmonics	
	3	2.30		3	0.80
	5	1.14		5	0.60
	7	0.77		7	0.45
	9	0.40		9	0.30
	11	0.33		11	0.17
	13	0.21		13	0.12
	15≤n≤39	0.15 · 15/n		15≤n≤39	0.10 · 15/n
	Even Harmonics			Even Harmonics	
	2	1.08		2	0.30
	4	0.43		4	0.15
	8	0.30			
	8≤n≤40	0.23 · 8/n		DC	0.05

EN 61000-3-2/IEC 61000-3-2					
Equipment Category	Max. Permissible Harmonic Current (in Ampers)	Equipment Category	Harmonic Order n	Max. Permissible Harmonic Current (in A)	(mA/w)
Class A	Same as Limits Specified in 4-2.1, Table - I, but only odd harmonics required	Class D	3	2.30	3.4
			5	1.14	1.9
			7	0.77	1.0
			9	0.40	0.5
			11	0.33	0.35
			13≤n≤39	see Table I	3.85/n
			only odd harmonics required		

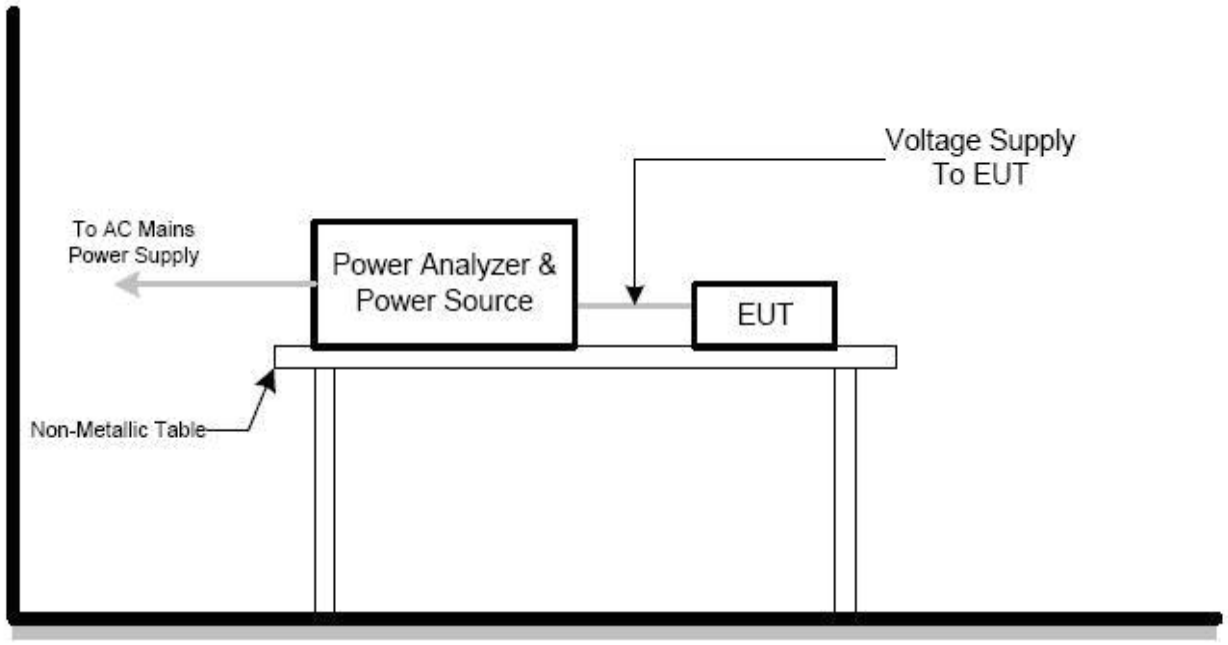
3.3.1.1TEST PROCEDURE

a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions.
b. The classification of EUT is according to section 5 of EN IEC 61000-3-2. The EUT is classified as follows:
Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.
Class B: Portable tools. Portable tools.; Arc welding equipment which is not professional equipment.
Class C: Lighting equipment.
Class D: Equipment having a specified power less than or equal to600 W of the following types: Personal computers and personal computer monitors and television receivers.
c. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

3.3.1.2 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.3.1.3 TEST SETUP



3.3.2 TEST RESULTS

EUT：	Ultrasonic Cleaner	Model Name ：	GC01
Temperature：	N/A	Relative Humidity：	N/A
Pressure：	N/A	Test Date：	N/A
Test Mode ：	N/A		
Test Power ：	N/A		
Note: EUT power is less than 75W, so this test report is not applicable.			

3.4 VOLTAGE FLUCTUATION AND FLICKERS

3.4.1 LIMITS OF VOLTAGE FLUCTUATION AND FLICKERS

Tests	Limits		Descriptions
	IEC555-3	IEC/EN 61000-3-3	
Pst	≤ 1.0, Tp= 10 min.	≤ 1.0, Tp= 10 min.	Short Term Flicker Indicator
Plt	N/A	≤ 0.65, Tp=2 hr.	Long Term Flicker Indicator
dc	≤ 3%	≤ 3.3%	Relative Steady-State V-Chang
dmax	≤ 4%	≤ 4%	Maximum Relative V-change
d (t)	N/A	≤ 3.3% for > 500 ms	Relative V-change characteristic

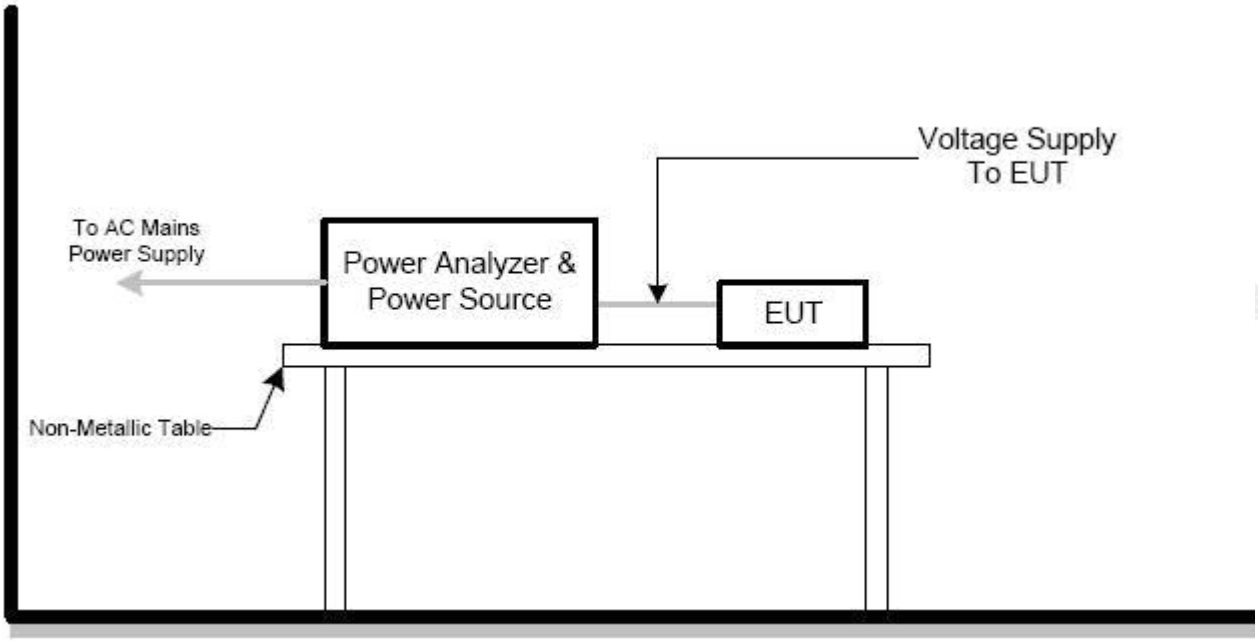
3.4.1.1TEST PROCEDURE

a. Harmonic Current Test:
Test was performed according to the procedures specified in Clause 5.0 of IEC555-2 and/or Sub-clause 6.2 of IEC/EN IEC 61000-3-2 depend on which standard adopted for compliance measurement.
b. Fluctuation and Flickers Test:
Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in Clause 5.0/6.0 of IEC555-3 and/or Clause 6.0/4.0 of IEC/EN 61000-3-3 depend on which standard adopted for compliance measurement.
c. All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

3.4.1.2 EUT OPERATING CONDITIONS

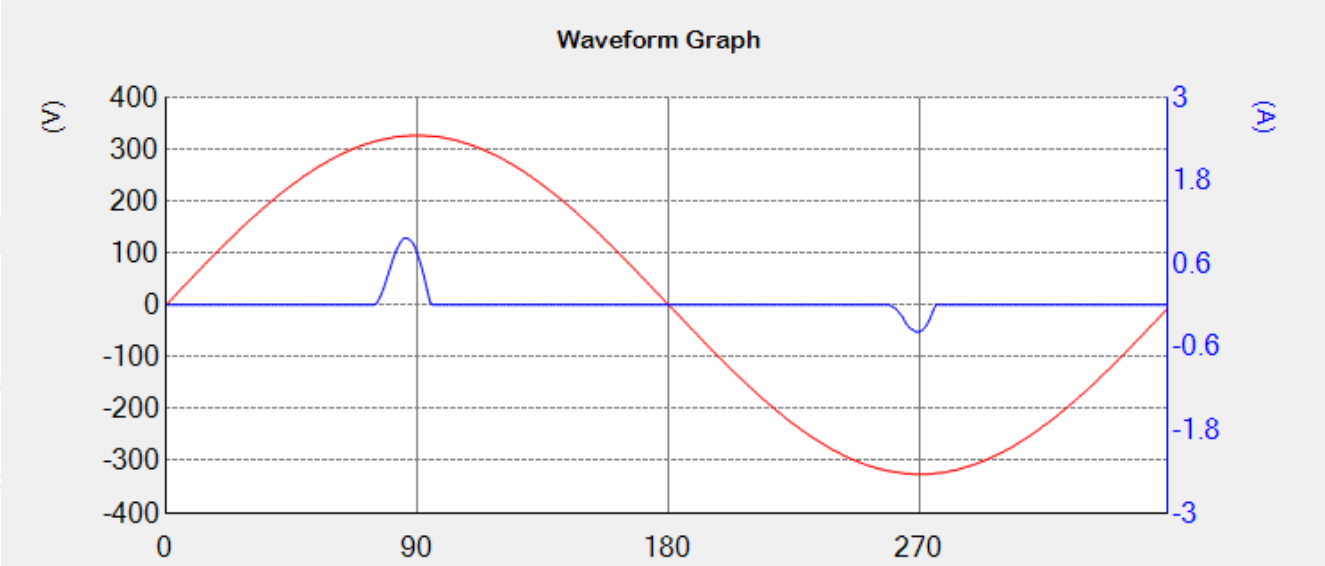
The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

3.4.1.3 TEST SETUP



3.4.2 TEST RESULTS

EUT :	Ultrasonic Cleaner	Model Name :	GC01
Temperature :	23.5 ℃	Relative Humidity :	51%
Pressure :	1010 hPa	Test Date :	2025-03-24
Test Mode :	Mode 1		
Test Power :	DC 12V From Adapter		



Voltage Fluctuations & Flicker | Additional

	Measured	Limit	Status
dmax	0.15%	4%	pass
Tmax	0ms	500ms	pass
Maximun dc	0.16%	3.3%	pass
	0.00		
Plt	0.00	0.65	pass

4. EMC IMMUNITY TEST

4.1 STANDARD COMPLIANCE/SERVRITY LEVEL/CRITERIA

Tests Standard No.	TEST SPECIFICATION	Test Mode Test Ports	Perform. Criteria
1. ESD IEC/EN 61000-4-2	8KV air discharge 4KV contact discharge	Direct Mode	B
	4KV HCP discharge 4KV VCP discharge	Indirect Mode	B
2. RS IEC/EN IEC 61000-4-3	80 MHz to 1000 MHz, 80%, AM modulated	Enclosure	A
3. EFT/Burst IEC/EN 61000-4-4	5/50ns Tr/Th 5KHz Repetition Freq.	Power Supply Port	B
	5/50ns Tr/Th 5KHz Repetition Freq.	CTL/Signal Data Line Port	B
4. Surges IEC/EN 61000-4-5	1.2/50(8/20) Tr/Th us	L-N	B
	1.2/50(8/20) Tr/Th us	L-PE N-PE	B
5 Injected Current IEC/EN 61000-4-6	0.15 MHz to 230 MHz, 1000Hz 80%, AM Modulated 150Ω source impedance	CTL/Signal Port	A
	0.15 MHz to 230 MHz, 1000Hz 80%, AM Modulated 150Ω source impedance	AC Power Port	A
	0.15 MHz to 230 MHz, 1000Hz 80%, AM Modulated 150Ω source impedance	DC Power Port	A
6. Volt. Interruptions Volt. Dips IEC/EN IEC 61000-4-11	Voltage dip 0% Voltage dip 30% Voltage dip 60%	AC Power Port	C C C

4.2 GENERAL PERFORMANCE CRITERIA

According to **EN IEC 55014-2** standard, the general performance criteria as following:

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 manufacturer 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.
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 manufacturer, 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 operating state or stored data is allowed to persist after the test.
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 manufacturer's instructions. Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

4.3 GENERAL PERFORMANCE CRITERIA TEST SETUP

The EUT tested system was configured as the statements of **2.3** Unless otherwise a special operating condition is specified in the follows during the testing.

4.4 ESD TESTING

4.4.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Required Performance	B
Discharge Voltage:	Air Discharge：2kV/4kV/8kV (Direct) Contact Discharge：2kV/4kV (Direct/Indirect)
Polarity:	Positive & Negative
Number of Discharge:	Air Discharge: min. 20 times at each test point Contact Discharge: min. 20 at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum

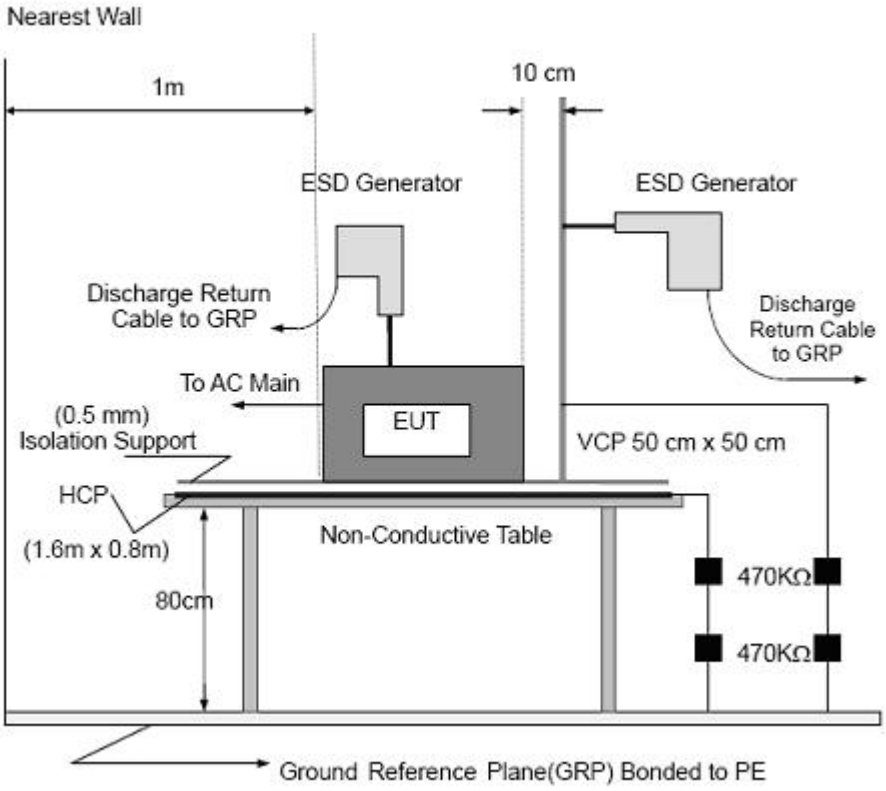
4.4.2 TEST PROCEDURE

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

a. Contact discharge was applied to conductive surfaces and coupling planes of the EUT. During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second. The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges.
If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.
Vertical Coupling Plane (VCP):
The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane. The four faces of the EUT will be performed with electrostatic discharge.
Horizontal Coupling Plane (HCP):
The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane. The four faces of the EUT will be performed with electrostatic discharge.

b. Air discharges at insulation surfaces of the EUT.
It was at least ten single discharges with positive and negative at the same selected point.

4.4.3 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test, was installed in a representative system as described in section 7 of IEC /EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in section 7 of IEC/EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

4.4.4 TEST RESULTS

EUT :	Ultrasonic Cleaner	Model Name :	GC01
Temperature :	23.5 ℃	Relative Humidity :	52%
Pressure :	1010 hPa	Test Date :	2025-03-24
Test Mode :	Mode 1		
Test Power :	DC 12V From Adapter		

Mode	Air Discharge								Contact Discharge								Criterion	Result
Test level (kV)	4		8		10		15		2		4		6		8			
Test Location	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-		
HCP									A	A	A	A					B	PASS
VCP									A	A	A	A						PASS
Metallic parts									/	/	/	/						N/A
enclosure	A	A	A	A														PASS
slot	A	A	A	A														PASS

Note:

1) +/- denotes the Positive/Negative polarity of the output voltage.
2) Test condition:
   Direct / Indirect (HCP/VCP) discharges: Minimum 50 times (Positive/Negative) at each point. Air discharges: Minimum 10 times (Positive/Negative) at each point.
3) Test location(s) in which discharge (Air and contact discharge) to be applied illustrated by photos shown in next page(s)
4) The Indirect (HCP/VCP) discharges description of test point as following:
   1.left side 2.right side 3.front side 4.rear side
5) N/A - denotes test is not applicable in this test report

4.5 RS TESTING

4.5.1 TEST SPECIFICATION

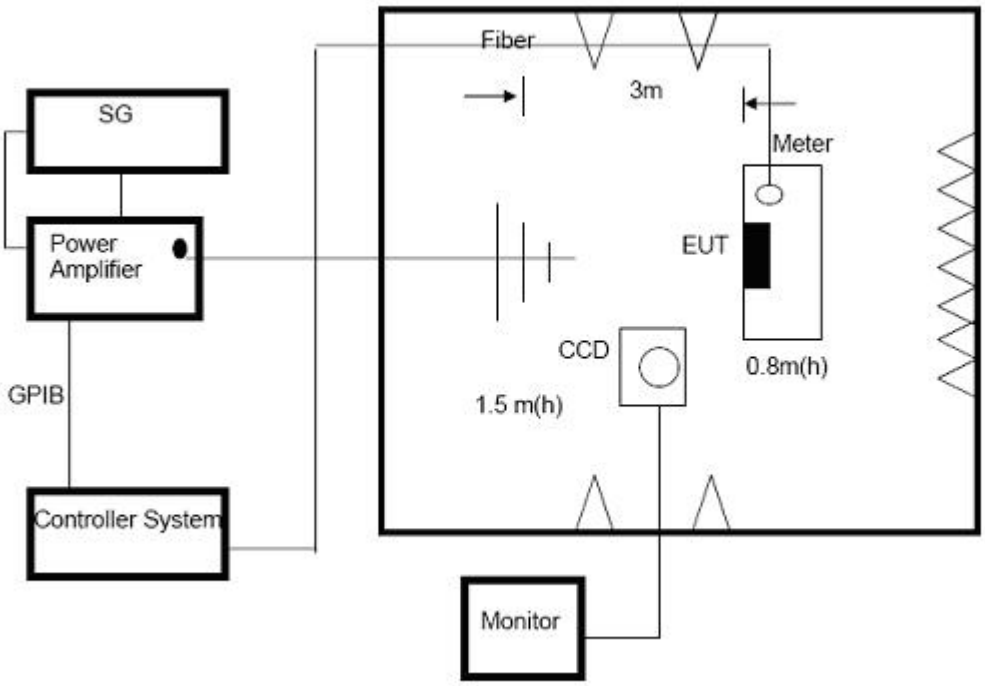
Basic Standard:	IEC/EN IEC 61000-4-3
Required Performance	A
Frequency Range:	80 MHz - 1000 MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5 m
Dwell Time:	at least 3 seconds

4.5.2 TEST PROCEDURE

The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.
The testing distance from antenna to the EUT was 3 meters.
The other condition as following manner:

a. The frequency range is swept from 80 MHz to 1000 MHz, & 1400MHz - 2700MHz with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
b. Sweep Frequency 900 MHz, with the Duty Cycle:1/8 and Modulation: Pulse 217 Hz(if applicable)
c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
d. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

4.5.3 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN IEC 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN IEC 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

4.5.4 TEST RESULTS

EUT：	Ultrasonic Cleaner	Model Name ：	GC01
Temperature：	N/A	Relative Humidity：	N/A
Pressure：	N/A	Test Date：	N/A
Test Mode ：	N/A		
Test Power ：	N/A		
Note: EUT is belong Category II, so this test report is not applicable.			

4.6 EFT/BURST TESTING

4.6.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-4
Required Performance	B
Test Voltage:	Power Line：1 kV Signal/Control Line：0.5 KV
Polarity:	Positive & Negative
Impulse Frequency:	5 kHz
Impulse Wave shape :	5/50 ns
Burst Duration:	15 ms
Burst Period:	300 ms
Test Duration:	Not less than 1 min.

4.6.2 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min.

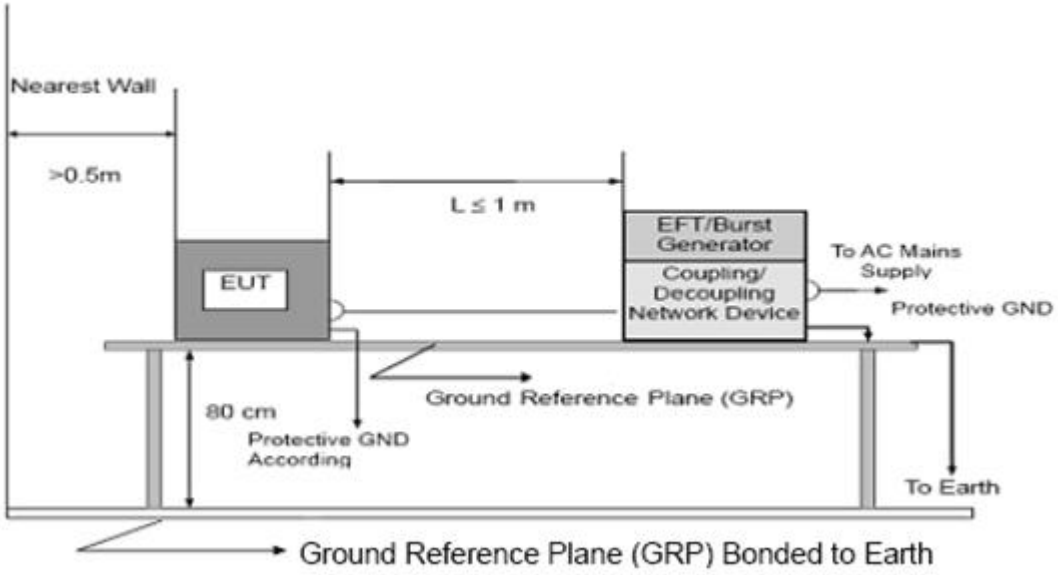
The other condition as following manner:

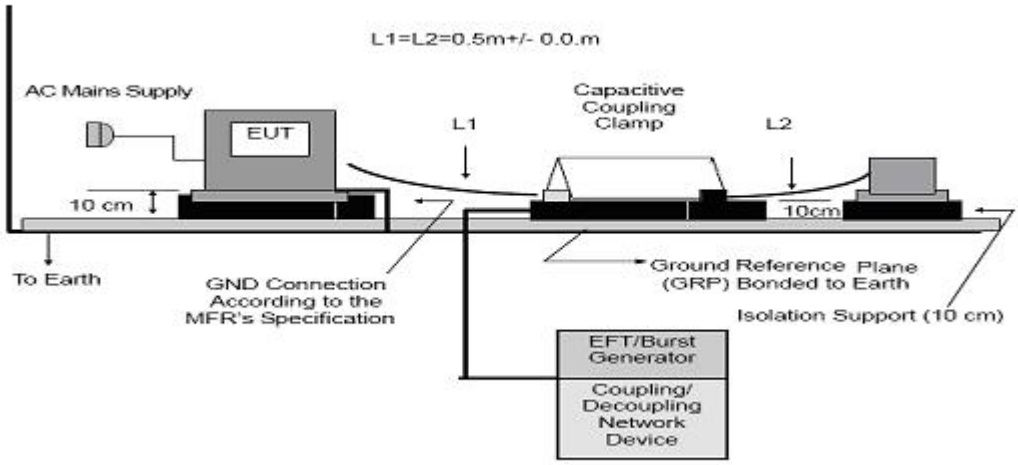
a. The length of power cord between the coupling device and the EUT should not exceed 1 meter.

b. Both positive and negative polarity discharges were applied.

c. The duration time of each test sequential was 1 minute

4.6.3 TEST SETUP





Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in section 7 of IEC/EN 61000-4-4 and its cables, were isolated from the Ground Reference Plane by an insulating support that is 0.1-meter thick. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system.

4.6.4 TEST RESULTS

EUT :	Ultrasonic Cleaner	Model Name :	GC01
Temperature :	23.5 ℃	Relative Humidity :	51%
Pressure :	1010 hPa	Test Date :	2025-03-24
Test Mode :	Mode 1		
Test Power :	DC 12V From Adapter		

Coupling Line		Test level (kV)								Criterion	Result
		0.5		1		2		4			
		+	-	+	-	+	-	+	-		
AC line	L	A	A	A	A					B	**PASS**
	N	A	A	A	A						**PASS**
	PE										
	L+N	A	A	A	A						**PASS**
	L+PE										
	N+PE										
	L+N+PE										
DC Line											
Signal Line											

Note:

1) +/- denotes the Positive/Negative polarity of the output voltage.

2) N/A - denotes test is not applicable in this test report

3) Criteria A: There was no change operated with initial operating during the test.

4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.

5) Criteria C: The system shut down during the test.

4.7 SURGE TESTING

4.7.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-5
Required Performance	B
Wave-Shape:	Combination Wave 1.2/50 us Open Circuit Voltage 8 /20 us Short Circuit Current
Test Voltage:	Power Line：0.5 kV, 1 kV, 2 kV
Surge Input/Output:	L-N, L-PE, N-PE
Generator Source:	2 ohm between networks
Impedance:	12 ohm between network and ground
Polarity:	Positive/Negative
Phase Angle:	0 /90/180/270°
Pulse Repetition Rate:	1 time / min. (maximum)
Number of Tests:	5 positive and 5 negative at selected points

4.7.2 TEST PROCEDURE

a. For EUT power supply:

The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2meters in length (or shorter).

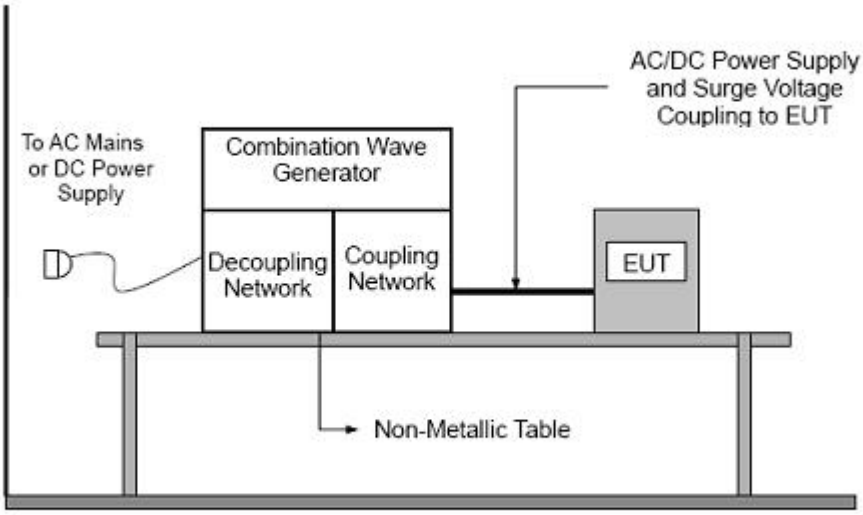
b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:

The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

c. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT:

d. The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

4.7.3 TEST SETUP



4.7.4 TEST RESULTS

EUT：	Ultrasonic Cleaner	Model Name ：	GC01
Temperature：	23.5 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Date：	2025-03-24
Test Mode ：	Mode 1		
Test Power ：	DC 12V From Adapter		

Coupling Line			Test level								Criterion	Result
			0.5 kV		1 kV		2 kV		4 kV			
			+	-	+	-	+	-	+	-		
AC line	L-N	0°									B	PASS
		90°	A		A							
		180°										
		270°		A		A						
	L-PE	0°										
		90°										
		180°										
		270°										
	N-PE	0°										
		90°										
		180°										
		270°										
DC Line												
Signal Line												

Note:

1) Polarity and Numbers of Impulses：5 Pst / Ngt at each tested mode
2) N/A - denotes test is not applicable in this Test Report
3) Criteria A: There was no change operated with initial operating during the test.
4) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
5) Criteria C: The system shut down during the test.

4.8 INJECTION CURRENT TESTING

4.8.1 TEST SPECIFICATION

Basic Standard:	IEC/EN 61000-4-6
Required Performance	A
Frequency Range:	0.15 MHz - 230 MHz
Field Strength:	3 Vr.m.s.
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of fundamental
Dwell Time:	at least 3 seconds

4.8.2 TEST PROCEDURE

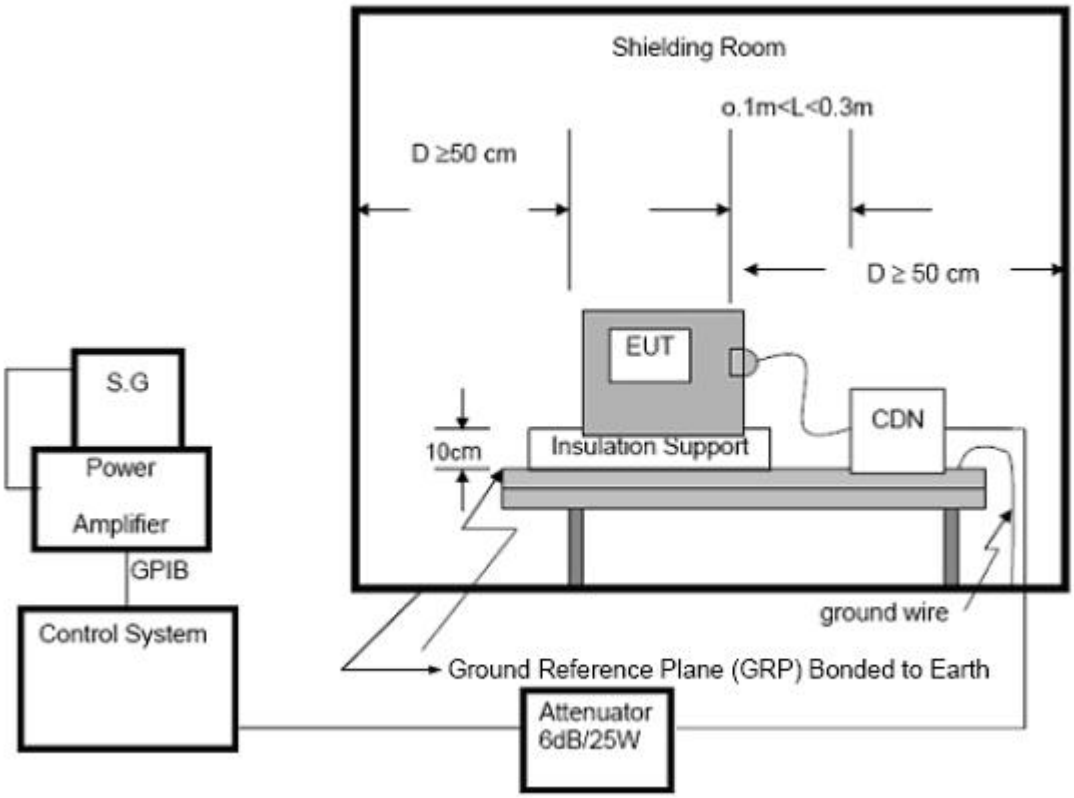
The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min.

The other condition as following manner:

a. The frequency range is swept from 150 KHz to 230 MHz, with the signal 80%amplitude modulated with a 1kHz sine wave. The rate of sweep did not exceed 1.5x 10-3 decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.

b. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

4.8.3 TEST SETUP



NOTE:

FLOOR-STANDING EQUIPMENT

The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.

4.8.4 TEST RESULTS

EUT :	Ultrasonic Cleaner	Model Name :	GC01
Temperature :	24 ℃	Relative Humidity :	51%
Pressure :	1010 hPa	Test Date :	2025-03-24
Test Mode :	Mode 1		
Test Power :	DC 12V From Adapter		

Test Ports (Mode)	Freq. Range MHz)	Field Strength	Perform. Criteria	Results	Judgment
Input/ Output AC. Power Port	0.15 ---230	3V(rms) AM Modulated 1000Hz, 80%	**A**	**A**	**PASS**
Input/ Output DC. Power Port	0.15 ---230		**A**	**N/A**	**N/A**
Signal Line	0.15 ---230		**A**	**N/A**	**N/A**

Note:

1) N/A - denotes test is not applicable in this Test Report.
2) Criteria A: There was no change operated with initial operating during the test.
3) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
4) Criteria C: The system shut down during the test.

4.9 VOLTAGE INTERRUPTION/DIPS TESTING

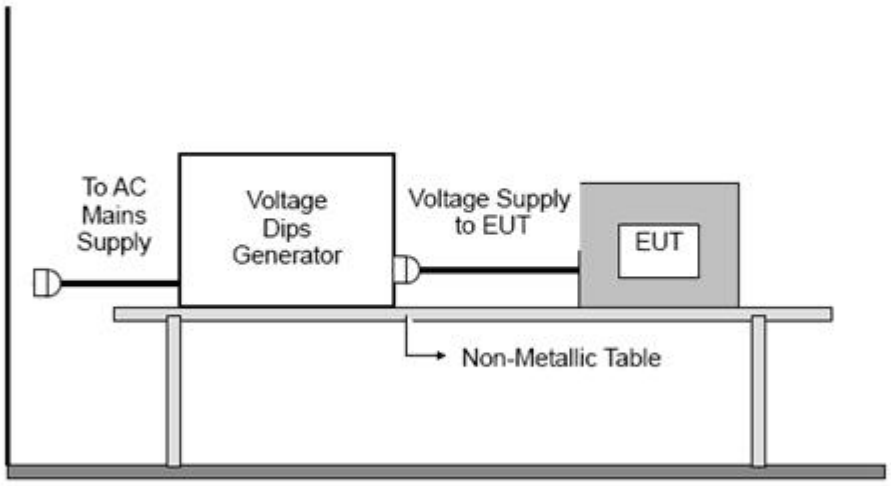
4.9.1 TEST SPECIFICATION

Basic Standard:	IEC/EN IEC 61000-4-11
Interruption & Dips	C (For 0% Voltage Dips) C (For 40% Voltage Dips) C (For 70% Voltage Dips)
Test Duration Time:	Minimum three test events in sequence
Interval between Event:	Minimum ten seconds
Phase Angle:	0°/45°/90°/135°/180°/225°/270°/315°/360°
Test Cycle:	3 times

4.9.2 TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

4.9.3 TEST SETUP



4.9.4 TEST RESULTS

EUT：	Ultrasonic Cleaner	Model Name ：	GC01
Temperature：	24 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Date：	2025-03-24
Test Mode ：	Mode 1		
Test Power ：	DC 12V From Adapter		

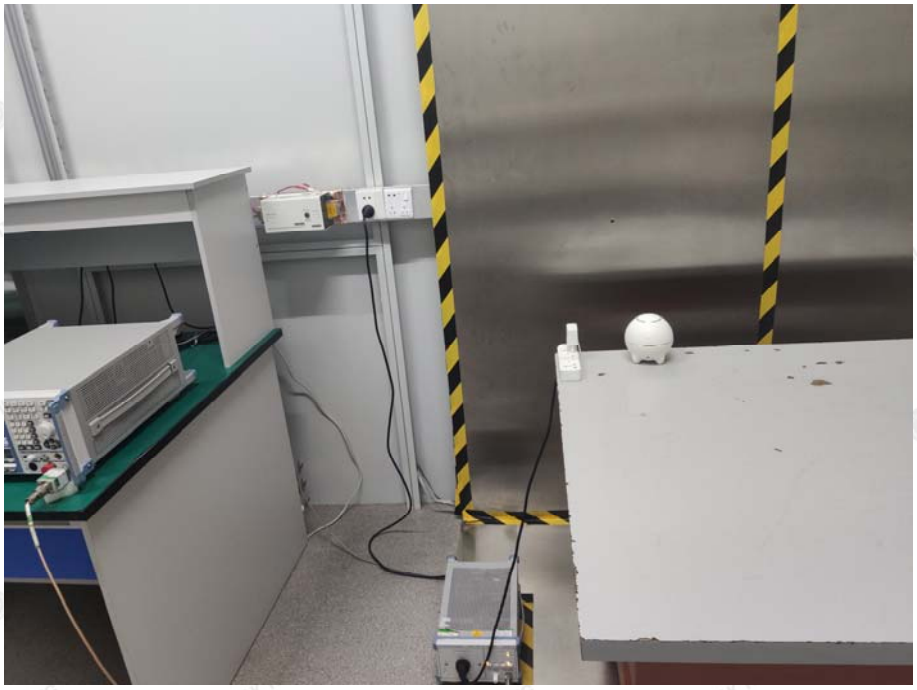
Interruption & Dips	Duration (ms)	Perform Criteria	Results	Judgment
Voltage dip 0%	10	**C**	**A**	**PASS**
Voltage dip 40%	200	**C**	**C**	**PASS**
Voltage dip 70%	500	**C**	**C**	**PASS**

Note:

1). N/A - denotes test is not applicable in this test report.
2) Criteria A: There was no change operated with initial operating during the test.
3) Criteria B: The EUT function loss during the test, but self-recoverable after the test.
4) Criteria C: The system shut down during the test.

5. EUT TEST PHOTO

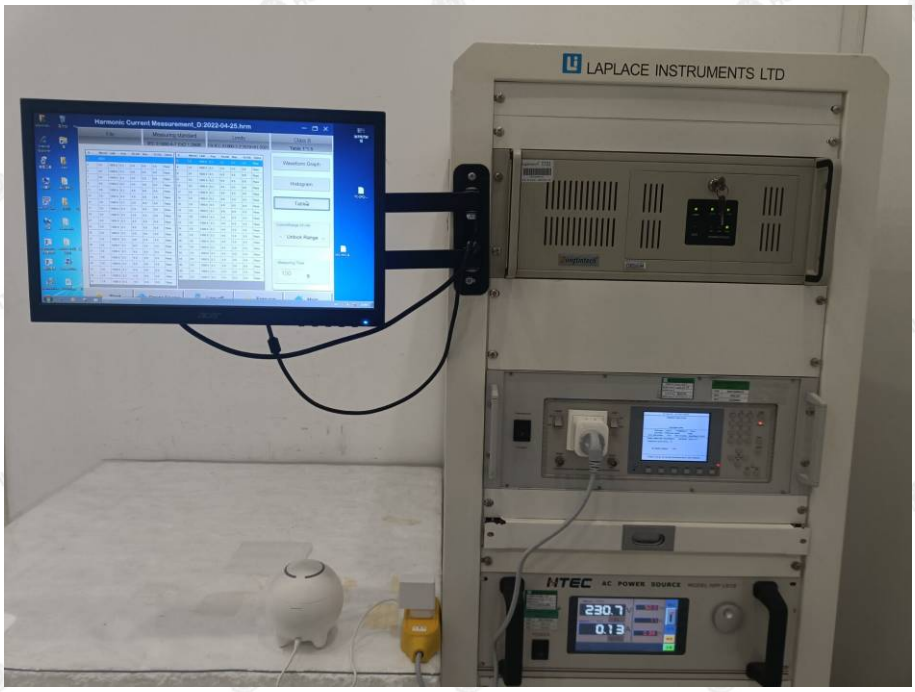
Conducted Emission



Disturbance Power

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Flicker



Electrostatic Discharge

Injected currents

EFT & Surge & Voltage Dips

ATTACHMENT PHOTOGRAPHS OF EUT

Photo 1

Photo 2

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Photo 3

Photo 4

Photo 5

Photo 6

Photo 7

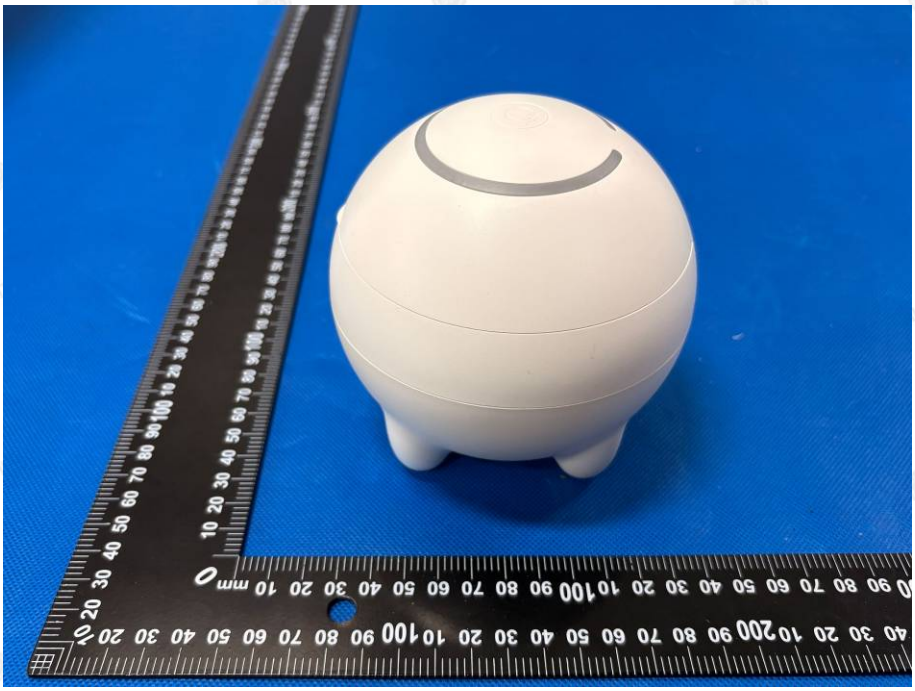


Photo 8

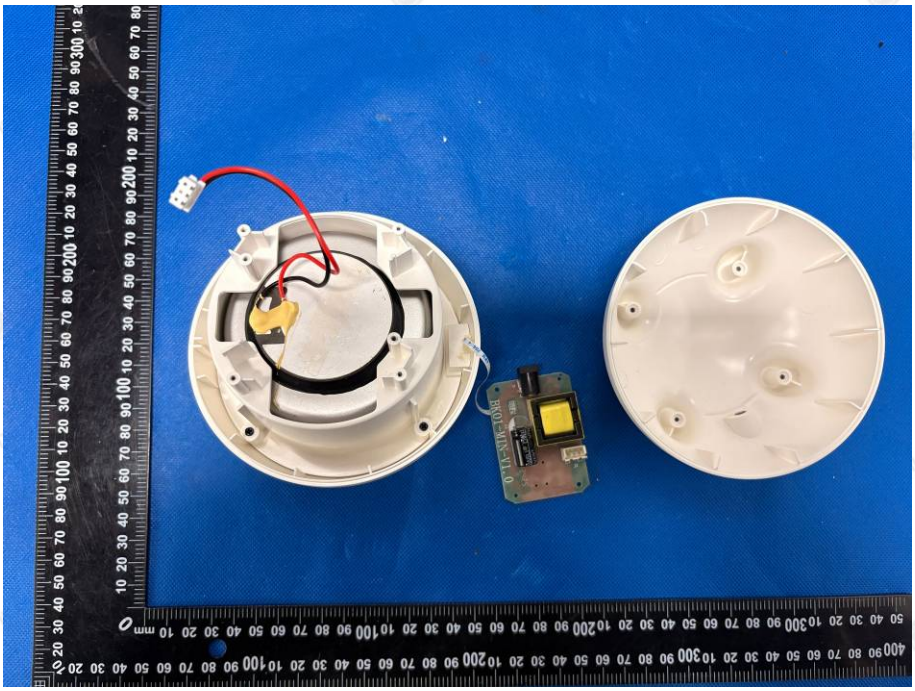


Photo 9

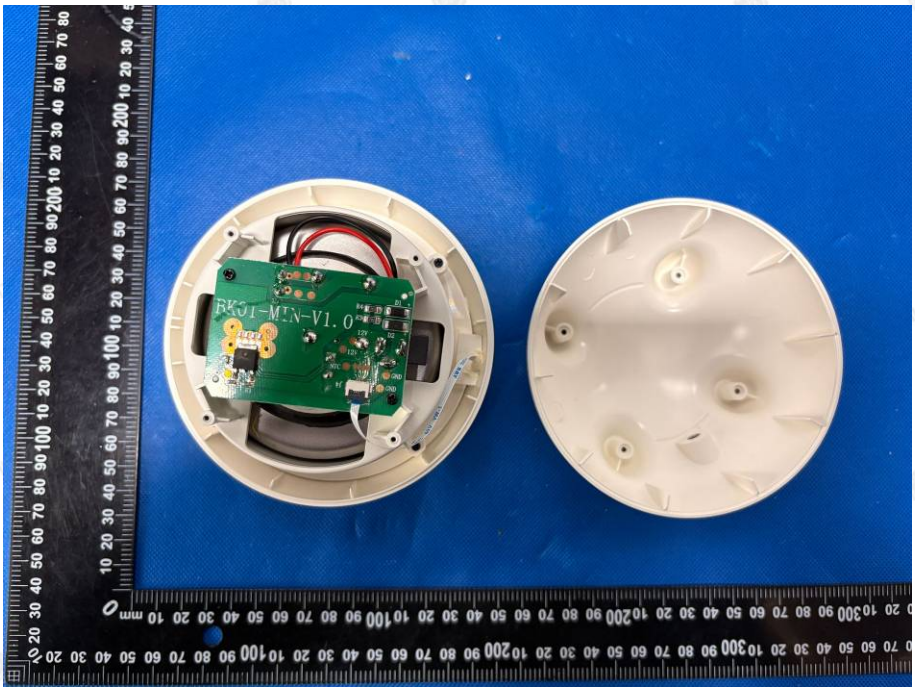


Photo 10

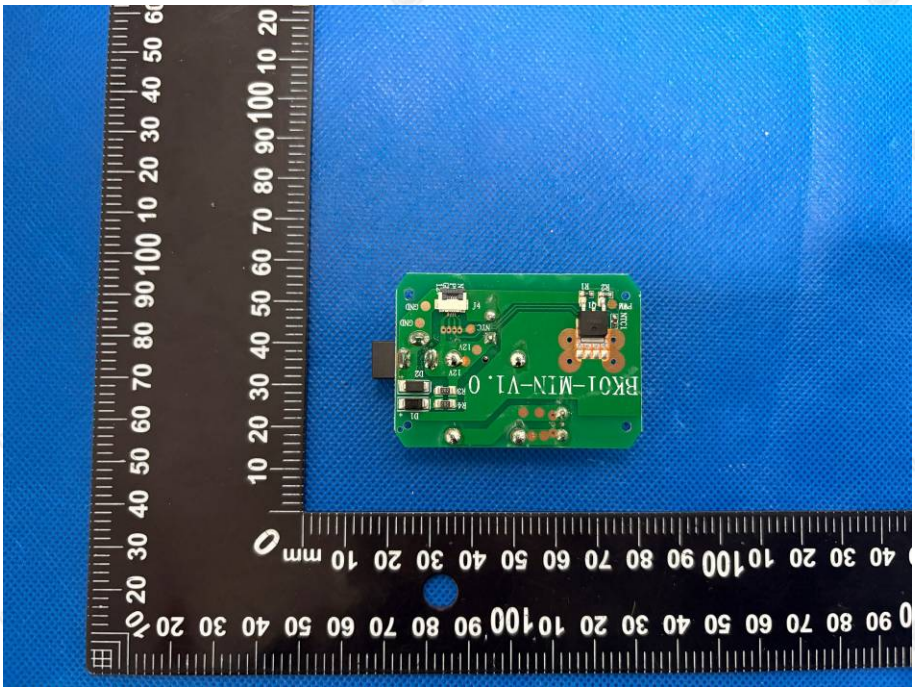
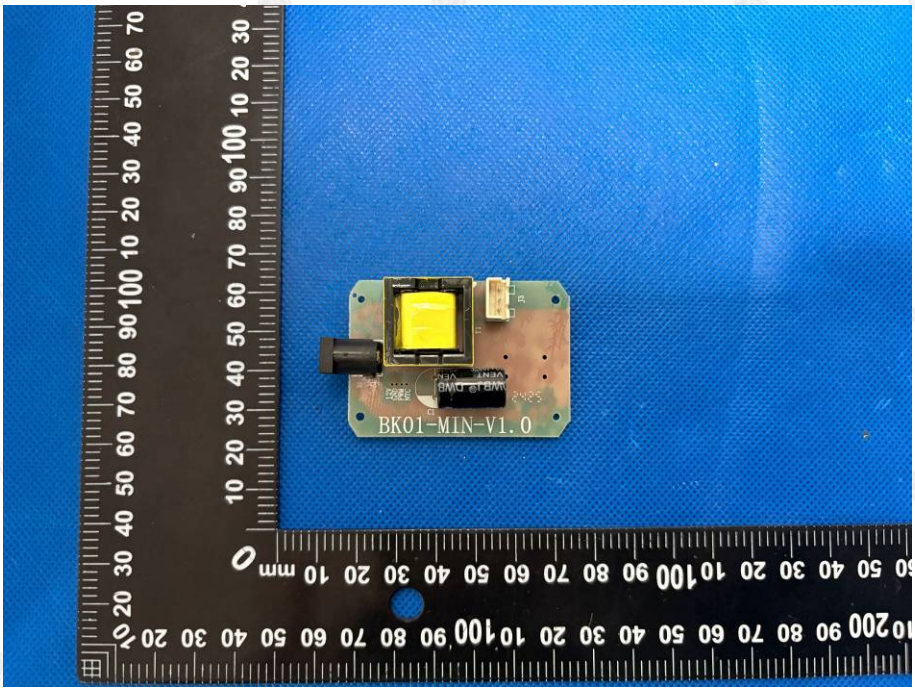


Photo 11



.....End of Report.....

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

This certificate is responsible for testing sample only.
Please refer to this corresponding test report to get testing process and data.

CERTIFICATE

ATTESTATION
Certificate of Compliance

Technical file of the company mentioned below has been inspected and audit has been completed successfully

The RoHS Directive 2015/863/EU amending Annex II to Directive 2011/65/EU has been taken as references for these processes.

Certificate's Holder	:	Granbo Technology Industrial Shenzhen Co., Ltd.
Address	:	A, 17th Floor, S&T Building, Quanzhi Technology Innovation Park, Industrial Building, Maozhoushan Industrial Park, Houting Community, Shajing Street, Baoan District, Shenzhen, China
Manufacturer	:	Granbo Technology Industrial Shenzhen Co., Ltd.
Address	:	A, 17th Floor, S&T Building, Quanzhi Technology Innovation Park, Industrial Building, Maozhoushan Industrial Park, Houting Community, Shajing Street, Baoan District, Shenzhen, China
Product Name:	:	Ultrasonic Cleaner
Model No.:	:	GC01, GC01M, GC01U, GC01BM, GC01BU, BK-01, BK-02, BK-03, BK-04, BK-05, BK-06, BK-07, BK-08, BK-09, BK-10
Trade Mark	:	N/A
Related Directive	:	Directive 2015/863/EU amending Annex II to Directive 2011/65/EU Directive (EU)2017/2102 amending Annex III to Directive 2011/65/EU
Certificate Number	:	HK2503143244R
Report No.	:	HK2503143244-1RR
Issue date	:	March 25, 2025

Jason Zhou

Certification Manager

The information of the certificate can be checked through www.cer-mark.com. The CE mark which is shown on the certificate can only be used under the conditions that the products complete with all of the relevant Directives of EC Declaration of Conformity. The Manufacturer should be responsible for the internal production control so that the products complied with the essential requirements of the above mentioned Directive(s). Certificate holder must notify all changes to the original certification laboratory of HUAK.

CE

Shenzhen HUAK Testing Technology Co., Ltd.

Add.: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Tel.:+86-755-2302 9901 Http:// www.cer-mark.com Postcode:518103 E-mail: service@cer-mark.com

TEST REPORT

Prepared for:

Granbo Technology Industrial Shenzhen Co., Ltd.

A, 17th Floor, S&T Building, Quanzhi Technology Innovation Park, Industrial Building, Maozhoushan Industrial Park, Houting Community, Shajing Street, Baoan District, Shenzhen, China

Product Name:	**Ultrasonic Cleaner**
Model No.:	**GC01, GC01M, GC01U, GC01BM, GC01BU, BK-01, BK-02, BK-03, BK-04, BK-05, BK-06, BK-07, BK-08, BK-09, BK-10**
Trade Mark:	**N/A**
Date of Test:	**From March 14, 2025 to March 20, 2025**
Date of Report:	**March 25, 2025**
Report Number:	**HK2503143244-1RR**

Prepared by:

Shenzhen HUAK Testing Technology Co., LTD.

1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Applicant:	**Granbo Technology Industrial Shenzhen Co., Ltd.**
Address:	**A, 17th Floor, S&T Building, Quanzhi Technology Innovation Park, Industrial Building, Maozhoushan Industrial Park, Houting Community, Shajing Street, Baoan District, Shenzhen, China**
Manufacturer:	**Granbo Technology Industrial Shenzhen Co., Ltd.**
Address:	**A, 17th Floor, S&T Building, Quanzhi Technology Innovation Park, Industrial Building, Maozhoushan Industrial Park, Houting Community, Shajing Street, Baoan District, Shenzhen, China**

The following sample was submitted and identified by/on behalf of the client as:

Product Name:	Ultrasonic Cleaner
Model No.:	GC01
Series No.:	GC01M, GC01U, GC01BM, GC01BU, BK-01, BK-02, BK-03, BK-04, BK-05, BK-06, BK-07, BK-08, BK-09, BK-10
Trade Mark:	N/A
Sample Receiving Date:	March 14, 2025
Testing Period:	From March 14, 2025 to March 20, 2025
Results:	Please refer to next page(s).

****

Summary of Test Results:

Test Requested:	According to customer's requirements, Split the sample and determine the Pb, Cd, Hg, Cr(VI), PBBs & PBDEs, DBP, BBP, DEHP, DIBP content of the parts.
Conclusion:	Base upon the performed tests by submitted sample, the test results comply with the limits as set by Directive (EU) 2015/863 - Amendment of EU RoHS Directive 2011/65/EU (RoHS 2.0) Annex II.

****

Signed for and on behalf of HUAK

Approved by: Jason Zhou

Lab Manager

Information of the Test Laboratory

Shenzhen HUAK Testing Technology Co., Ltd.

Add.: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Testing Laboratory Authorization：

A2LA Accreditation Code is 4781.01.

FCC Designation Number is CN1229.

Canada IC CAB identifier is CN0045.

CNAS Registration Number is L9589.

CPSC Certification Number is 1710.

****

Test Method:

1. Sample prepared with reference to IEC 62321-1:2013 / IEC 62321-2:2021
2. Sample Screening testing with reference to IEC 62321-3-1:2013
3. Wet Chemical Test Method
   a. Determination of Lead, Cadmium by ICP-OES with reference to IEC 62321-5:2013
   b. Determination of Mercury by ICP-OES with reference to IEC 62321-4:2013+AMD1:2017
   c. Determination of Hexavalent Chromium in colourless and coloured corrosion-protected coatings on metals by UV-VIS method reference to IEC 62321-7-1:2015
   d. Determination of Hexavalent Chromium in polymers and electronics by UV-Vis Method with reference to IEC 62321-7-2:2017.
   e. Determination of PBBs and PBDEs by GC-MS with reference to IEC 62321-6:2015
   f. Determination of DBP, BBP, DEHP and DIBP by GC-MS with reference to IEC 62321-8:2017

Test Results:

Part No.	Part Name	Restricted Substances	Result of EDXRF (1)	Result of Chemical Testing (2) (mg/kg)	Conclusion on RoHS
1	White plastic case	Pb	BL	---	Comply
		Cd	BL	---	Comply
		Hg	BL	---	Comply
		Cr(VI)	BL	---	Comply
		PBBs	BL	---	Comply
		PBDEs	BL	---	Comply
		DBP	---	N.D.	Comply
		BBP	---	N.D.	Comply
		DEHP	---	N.D.	Comply
		DIBP	---	N.D.	Comply
2	White transparent plastic	Pb	BL	---	Comply
		Cd	BL	---	Comply
		Hg	BL	---	Comply
		Cr(VI)	BL	---	Comply
		PBBs	BL	---	Comply
		PBDEs	BL	---	Comply
		DBP	---	N.D.	Comply
		BBP	---	N.D.	Comply
		DEHP	---	N.D.	Comply
		DIBP	---	N.D.	Comply
3	Grey rubber	Pb	BL	---	Comply
		Cd	BL	---	Comply
		Hg	BL	---	Comply
		Cr(VI)	BL	---	Comply
		PBBs	BL	---	Comply
		PBDEs	BL	---	Comply
		DBP	---	N.D.	Comply
		BBP	---	N.D.	Comply
		DEHP	---	N.D.	Comply
		DIBP	---	N.D.	Comply

Part No.	Part Name	Restricted Substances	Result of EDXRF (1)	Result of Chemical Testing (2) (mg/kg)	Conclusion on RoHS
4	Silver metal	Pb	BL	---	Comply
		Cd	BL	---	Comply
		Hg	BL	---	Comply
		Cr(VI)	IN	N.D.	Comply
		PBBs	---	---	NA
		PBDEs	---	---	NA
		DBP	---	---	NA
		BBP	---	---	NA
		DEHP	---	---	NA
		DIBP	---	---	NA
5	Green PCB board	Pb	BL	---	Comply
		Cd	BL	---	Comply
		Hg	BL	---	Comply
		Cr(VI)	BL	---	Comply
		PBBs	IN	N.D.	Comply
		PBDEs	IN	N.D.	Comply
		DBP	---	N.D.	Comply
		BBP	---	N.D.	Comply
		DEHP	---	N.D.	Comply
		DIBP	---	N.D.	Comply
6	Silver metal spring	Pb	BL	---	Comply
		Cd	BL	---	Comply
		Hg	BL	---	Comply
		Cr(VI)	BL	---	Comply
		PBBs	---	---	NA
		PBDEs	---	---	NA
		DBP	---	---	NA
		BBP	---	---	NA
		DEHP	---	---	NA
		DIBP	---	---	NA

Part No.	Part Name	Restricted Substances	Result of EDXRF (1)	Result of Chemical Testing (2) (mg/kg)	Conclusion on RoHS
7	Silver metal solder joints	Pb	BL	---	Comply
		Cd	BL	---	Comply
		Hg	BL	---	Comply
		Cr(VI)	BL	---	Comply
		PBBs	---	---	NA
		PBDEs	---	---	NA
		DBP	---	---	NA
		BBP	---	---	NA
		DEHP	---	---	NA
		DIBP	---	---	NA
8	Black coating (silver metal screws)	Pb	BL	---	Comply
		Cd	BL	---	Comply
		Hg	BL	---	Comply
		Cr(VI)	BL	---	Comply
		PBBs	---	---	NA
		PBDEs	---	---	NA
		DBP	---	---	NA
		BBP	---	---	NA
		DEHP	---	---	NA
		DIBP	---	---	NA
9	Silver metal solder joints	Pb	BL	---	Comply
		Cd	BL	---	Comply
		Hg	BL	---	Comply
		Cr(VI)	BL	---	Comply
		PBBs	---	---	NA
		PBDEs	---	---	NA
		DBP	---	---	NA
		BBP	---	---	NA
		DEHP	---	---	NA
		DIBP	---	---	NA

Part No.	Part Name	Restricted Substances	Result of EDXRF (1)	Result of Chemical Testing (2) (mg/kg)	Conclusion on RoHS
10	Green PCB board	Pb	BL	---	Comply
		Cd	BL	---	Comply
		Hg	BL	---	Comply
		Cr(VI)	BL	---	Comply
		PBBs	BL	---	Comply
		PBDEs	BL	---	Comply
		DBP	---	N.D.	Comply
		BBP	---	N.D.	Comply
		DEHP	---	N.D.	Comply
		DIBP	---	N.D.	Comply

Remark:

(1) (a) When conducting the test for PBBs&PBDEs, XRF was introducedto screen Br Exclusively, When conducting the test for Hexavalent Chromium, XRF was introduced to screen Chromium exclusively.
(b) Results are obtained by EDXRF for primary screening, and further chemical testing by ICP-OES (for Cd, Pb, Hg), UV-Vis (for Cr (VI)) and GC/MS (for PBBs, PBDEs) is recommended to be performed, if the concentration exceeds the below warning value according to IEC62321-3-1:2013 (unit: mg/kg)

Element	Polymer	Metal	Composite Materials
Cd	BL≤(70-3σ)<X<(130+3σ) ≤OL	BL≤(70-3σ)<X<(130+3σ) ≤OL	LOD<X<(150+3σ) ≤OL
Pb	BL≤(700-3σ)<X<(1300+3σ) ≤OL	BL≤(700-3σ)<X<(1300+3σ) ≤OL	BL≤(500-3σ)<X<(1500+3σ) ≤OL
Hg	BL≤(700-3σ)<X<(1300+3σ) ≤OL	BL≤(700-3σ)<X<(1300+3σ) ≤OL	BL≤(500-3σ)<X<(1500+3σ) ≤OL
Br	BL≤(300-3σ)<X	--	BL≤(250-3σ)<X
Cr	BL≤(700-3σ)<X	BL≤(700-3σ)<X	BL≤(500-3σ)<X

(c) BL = Below warning value, OL = Over Limit, IN = Inconclusive, LOD = Limit of Detection,
-- = Not Regulated, NA = Not Applicable.
(d) The XRF screening test for RoHS elements – The reading may be different to the actual content in the sample be of non-uniformity composition.

(2) (a) 1mg/kg = 1ppm = 0.0001%, N.D.= Not Detected (<MDL), --- = Not Conducted.
(b) Unit and Method Detection Limit (MDL) in wet chemical test

Test Items	Pb	Cd	Hg	DBP	BBP	DEHP	DIBP
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MDL	2	2	2	50	50	50	50

The MDL for single compound of PBBs & PBDEs is 5 mg/kg, MDL of Cr(VI) for polymer & composite sample is 8 mg/kg and MDL of DBP, BBP, DEHP and DIBP is 50mg/kg.
(c) When Cr(VI) for metal sample is testing according to IEC 62321-7-1:2015, the unit is μg/cm^2, and the MDL is 0,10 μg/cm^2. When the Cr (VI) concentration is > the 0,13 μg/cm^2, the sample is positive for Cr(VI) and considered to contain Cr(VI); when the Cr (VI) concentration is N.D.(< the 0,10 μg/cm^2), the sample is negative for Cr(VI) and considered a non-Cr(VI) based coating; when the Cr (VI) concentration is ≥ the 0,10 μg/cm^2 and ≤ the 0,13 μg/cm^2, the result is considered to be inconclusive - Unavoidable coating variations may influence the determination.

(d) For necessary wet chemistry measurements (flame retardants, phthalates) components with a weight of less than 0.1 grams are not considered for testing and rating due to technical measurement reasons.

(3) The maximum permissible limit is quoted from the Directive (EU) 2015/863 - Amendment of EU RoHS Directive 2011/65/EU (RoHS 2.0) Annex II.

RoHS Restricted Substances	**Maximum Concentration Value (by weight in homogenous materials)**
Lead (Pb)	0.1%
Cadmium (Cd)	0.01%
Mercury (Hg)	0.1%
Hexavalent Chromium (Cr VI)	0.1%
Polybrominated biphenyls (PBBs)	0.1%
Polybrominated diphenylethers (PBDEs)	0.1%
Dibutyl Phthalate (DBP)	0.1%
Benzylbutyl Phthalate (BBP)	0.1%
Bis-(2-ethylhexyl) Phthalate (DEHP)	0.1%
Diisobutyl Phthalate (DIBP)	0.1%

RoHS Exemptions

Exemptions	
Directive (EU)2017/2102 amending Annex III to Directive 2011/65/EU	
Exemption Items	**Expires Date**
1, Mercury in single capped (compact) fluorescent lamps not exceeding (per burner):	
1(a), For general lighting purposes < 30 W:3,5 mg	Expires on 24 February 2023
1(b), For general lighting purposes≥ 30 W and < 50W:3,5mg	Expires on 24 February 2023
1(c), For general lighting purposes ≥ 50 W and < 150 W: 5 mg	Expires on 24 February 2023
1(d), For general lighting purposes ≥ 150 W: 15 mg	Expires on 24 February 2023
1(e), For general lighting purposes with circular or square structural shape and tube diameter ≤ 17 mm: 7 mg	Expires on 24 February 2023
1(f)-I,For lamps designed to emit mainly light in the ultraviolet spectrum: 5 mg	Expires on 24 February 2027
1(f)-II,For special purposes: 5 mg	Expires on 24 February 2025
1(g),For general lighting purposes < 30 W with a lifetime equal or above 20000 h: 3,5 mg	Expires on 24 August 2023
2(a),Mercury in double-capped linear fluorescent lamps for general lighting purposes not exceeding (per lamp):	
2(a)(1),Tri-band phosphor with normal lifetime and a tube diameter < 9 mm (e.g. T2): 4 mg	Expires on 24 February 2023
2(a)(2),Tri-band phosphor with normal lifetime and a tube diameter ≥ 9 mm and ≤ 17 mm (e.g. T5): 3 mg	Expires on 24 August 2023
2(a)(3),Tri-band phosphor with normal lifetime and a tube diameter > 17 mm and ≤ 28 mm (e.g. T8):3.5mg	Expires on 24 August 2023
2(a)(4),Tri-band phosphor with normal lifetime and a tube diameter > 28 mm (e.g. T12): 5 mg	Expires on 24 February 2023
2(a)(5),Tri-band phosphor with long lifetime (≥ 25 000 h): 5 mg	Expires on 24 February 2023
2(b), Mercury in other fluorescent lamps not exceeding (per lamp):	
2(b)(1),Linearhalophosphate lamps with tube > 28 mm (e.g. T10 and T12): 10 mg	Expires on 13 April 2012
2(b)(2),Non-linear halophosphate lamps (all diameters): 15 mg	Expires on 13 April 2016
2(b)(3),Non-linear tri-band phosphor lamps with tube diameter > 17 mm (e.g. T9):15mg	Expires on 24 February 2023; 10 mg may be used per lamp from 25 February 2023 until 24 February 2025
2(b)(4) -I, Lamps for other general lighting and special purposes (e.g. induction lamps): 15 mg	Expires on 24 February 2025
2(b)(4) -II, Lamps emitting mainly light in the ultraviolet spectrum: 15 mg	Expires on 24 February 2027
2(b)(4) -III, Emergency lamps: 15 mg	Expires on 24 February 2027
3, Mercury in cold cathode fluorescent lamps and external electrode fluorescent lamps (CCFL and EEFL) for special purposes used in EEE placed on the market before 24 February 2022 not exceeding (per lamp):	
3(a), Short length (≤500 mm):3.5mg	Expires on 24 February 2025
3(b), Medium length (> 500 mm and ≤ 1 500 mm):5mg	Expires on 24 February 2025
3(c), Long length (> 1 500 mm):13mg	Expires on 24 February 2025
4(a), Mercury in other low pressure discharge lamps (per lamp):15mg	Expires on 24 February 2023
4(a)-I,Mercury in low pressure non-phosphor coated discharge lamps, where the application requires the main range of the lamp-spectral output to be in the ultraviolet spectrum: up to 15 mg mercury may be used per lamp	Expires on 24 February 2027
4(b), Mercury in High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner) in lamps with improved colour rendering index Ra > 80: P ≤ 105 W: 16 mg may be used per burner	Expires on 24 February 2027
4(b) -I,rendering indexRa > 60:P ≤155 W:30mg	Expires on 24 February 2023

Exemptions	
Directive (EU)2017/2102 amending Annex III to Directive 2011/65/EU	
Exemption Items	**Expires Date**
4(b) -II,rendering index Ra > 60:155 W < P ≤ 405 W:40mg	Expires on 24 February 2023
4(b) -III,rendering index Ra > 60: P > 405 W:40mg	Expires on 24 February 2023
4(c),Mercury in other High Pressure Sodium (vapour) lamps for general lighting purposes not exceeding (per burner):	
4(c)-I,P ≤ 155 W:20mg	Expires on 24 February 2027
4(c)-II,155 W < P ≤ 405 W:25mg	Expires on 24 February 2027
4(c)-III,P> 405 W:25mg	Expires on 24 February 2027
4(d),Mercury in High Pressure Mercury (vapour) lamps (HPMV)	Expires on 13 April 2015
4(e),Mercury in metal halide lamps (MH)	Expires on 24 February 2027
4(f)-I,Mercury in other discharge lamps for special purposes not specifically mentioned in this Annex	Expires on 24 February 2025
4(f)-II,Mercury in high pressure mercury vapour lamps used in projectors where an output ≥ 2000 lumen ANSI is required	Expires on 24 February 2027
4(f)-III,Mercury in high pressure sodium vapour lamps used for horticulture lighting	Expires on 24 February 2027
4(f)-IV,Mercury in lamps emitting light in the ultraviolet spectrum	Expires on 24 February 2027
4(g),Mercury in hand crafted luminous discharge tubes used for signs, decorative or architectural and specialist lighting and light-artwork, where the mercury content shall be limited as follows: (a) 20 mg per electrode pair + 0,3 mg per tube length in cm, but not more than 80 mg, for outdoor applications and indoor applications exposed to temperatures below 20 °C; (b) 15 mg per electrode pair + 0,24 mg per tube length in cm, but not more than 80 mg, for all other indoor applications.	Expires on 31 December 2018
5(a), Lead in glass of cathode ray tubes	
5(b), Lead in glass of fluorescent tubes not exceeding 0,2 % by weight	
6(a), Lead as an alloying element in steel for machining purposes and in galvanized steel containing up to 0,35 % lead by weight	
6(a)-I,Lead as an alloying element in steel for machining purposes containing up to 0,35 % lead by weight and in batch hot dip galvanised steel components containing up to 0,2 % lead by weight	
6(b),Lead as an alloying element in aluminium containing up to 0,4 % lead by weight	
6(b)-I, Lead as an alloying element in aluminium containing up to 0,4 % lead by weight	
6(b)-II, Lead as an alloying element in aluminium containing up to 0,4 % lead by weight	
6(c), Copper alloy containing up to 4 % lead by weight	
7(a), Lead in high melting temperature type solders (i.e. lead- based alloys containing 85 % by weight or more lead)	
7(b), Lead in solders for servers, storage and storage array systems, network infrastructure equipment for switching, signalling, transmission, and network management for telecommunications	
7(c)-I, Electrical and electronic components containing lead in a glass or ceramic other than dielectric ceramic in capacitors, e.g. piezoelectronic devices, or in a glass or ceramic matrix compound	
7(c)-II, Lead in dielectric ceramic in capacitors for a rated voltage of 125 V AC or 250 V DC or higher	
7(c)-III, Lead in dielectric ceramic in capacitors for a rated voltage of less than 125 V AC or 250 V DC	Expires on 1 January 2013 and after that date may be used in spare parts for EEE placed on the market before 1 January 2013

Exemptions	
Directive (EU)2017/2102 amending Annex III to Directive 2011/65/EU	
Exemption Items	**Expires Date**
7(c)-IV, Lead in PZT based dielectric ceramic materials for capacitors being part of integrated circuits or discrete semiconductors	Expires on: -21 July 2021 for categories 1-7 and 10; -21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; -21 July 2023 for category 8 in vitro diagnostic medical devices; -21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
8(a), Cadmium and its compounds in one shot pellet type thermal cut-offs	Expires on 1 January 2012 and after that date may be used in spare parts for EEE placed on the market before 1 January 2012
8(b), Cadmium and its compounds in electrical contacts	
8(b)-I,Cadmium and its compounds in electrical contacts used in: - circuit breakers, - thermal sensing controls, - thermal motor protectors (excluding hermetic thermal motor protectors), - AC switches rated at: 6 A and more at 250 V AC and more, or 12 A and more at 125 V AC and more, - DC switches rated at 20 A and more at 18 V DC and more, and - switches for use at voltage supply frequency ≥ 200 Hz	
9, Hexavalent chromium as an anticorrosion agent of the carbon steel cooling system in absorption refrigerators up to 0,75 % by weight in the cooling solution	
9(a)-I,Up to 0,75 % hexavalent chromium by weight, used as an anticorrosion agent in the cooling solution of carbon steel cooling systems of absorption refrigerators (including minibars) designed to operate fully or partly with electrical heater, having an average utilizedpower input < 75 W at constant running conditions	Applies to categories 1-7 and 10 and expires on 5 March 2021.
9(a)-II,Up to 0,75 % hexavalent chromium by weight, used as an anticorrosion agent in the cooling solution of carbon steel cooling systems of absorption refrigerators: - designed to operate fully or partly with electrical heater, having an average utilised power input ≥ 75 W at constant running conditions, - designed to fully operate with nonelectrical heater.	Applies to categories 1-7 and 10 and expires on 21 July 2021.
9(a)-III,Up to 0,7 % hexavalent chromium by weight, used as an anticorrosion agent in the working fluid of the carbon steel sealed circuit of gas absorption heat pumps for space and water heating	Applies to category 1 and expires on 31 December 2026.
9(b), Lead in bearing shells and bushes for refrigerant-containing compressors for heating, ventilation, air conditioning and refrigeration (HVACR) applications	Applies to categories 8, 9 and 11; expires on: - 21 July 2023 for category 8 in vitro diagnostic medical devices, - 21 July 2024 for category 9 industrial monitoring and control instruments and for category 11, - 21 July 2021 for other subcategories of categories 8 and 9.
9(b)-(I),Lead in bearing shells and bushes for refrigerant-containing hermetic scroll compressors with a stated electrical power input equal or below 9 kW for heating, ventilation, air conditioning and refrigeration (HVACR) applications	Applies to category 1; expires on 21 July 2019.
11(a), Lead used in C-press compliant pin connector systems	May be used in spare parts for EEE placed on the market before 24 September 2010
11(b), Lead used in other than C-press compliant pin connector systems	Expires on 1 January 2013 and after that date may be used in spare parts for EEE placed on the market before 1 January 2013

Exemptions	
Directive (EU)2017/2102 amending Annex III to Directive 2011/65/EU	
Exemption Items	**Expires Date**
12, Lead as a coating material for the thermal conduction module C-ring	May be used in spare parts for EEE placed on the market before 24 September 2010
13(a), Lead in white glasses used for optical applications	Applies to all categories; expires on: - 21 July 2023 for category 8 in vitro diagnostic medical devices; - 21 July 2024 for category 9 industrial monitoring and control instruments and for category 11; - 21 July 2021 for all other categories and subcategories
13(b), Cadmium and lead in filter glasses and glasses used for reflectance standards	Applies to categories 8, 9 and 11; expires on: - 21 July 2023 for category 8 in vitro diagnostic medical devices; - 21 July 2024 for category 9 industrial monitoring and control instruments and for category 11; - 21 July 2021 for other subcategories of categories 8 and 9
13(b)- (I),Lead in ion coloured optical filter glass types	
13(b)- (II),Cadmium in striking optical filter glass types; excluding applications falling under point 39 of this Annex	
13(b)- (III),Cadmium and lead in glazes used for reflectance standards	
14, Lead in solders consisting of more than two elements for the connection between the pins and the package of micropro-cessors with a lead content of more than 80 % and less than 85 % by weight	Expired on 1 January 2011 and after that date may be used in spare parts for EEE placed on the market before 1 January 2011
15, Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit flip chip packages	Applies to categories 8, 9 and 11 and expires on: - 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; - 21 July 2023 for category 8 in vitro diagnostic medical devices; - 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
15(a),Lead in solders to complete a viable electrical connection between the semiconductor die and carrier within integrated circuit flip chip packages where at least one of the following criteria applies:- a semiconductor technology node of 90 nm or larger; - a single die of 300 mm2 or larger in any semiconductor technology node; - stacked die packages with die of 300 mm2 or larger, or silicon interposers of 300 mm2 or larger	Applies to categories 1 to 7 and 10 and expires on 21 July 2021.
16, Lead in linear incandescent lamps with silicate coated tubes	Expires on 1 September 2013
17, Lead halide as radiant agent in high intensity discharge (HID) lamps used for professional reprography applications	
18(a), Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as speciality lamps for diazoprinting reprography, lithography, insect traps,photochemical and curing processes containing phosphors such as SMS ((Sr,Ba)2MgSi2O7:Pb)	

Exemptions	
Directive (EU)2017/2102 amending Annex III to Directive 2011/65/EU	
Exemption Items	**Expires Date**
18(b), Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lamps when used as sun tanning lamps containing phosphors such as BSP ($BaSi_2O_5$:Pb)	Expires on: - 21 July 2021 for categories 1-7 and 10; - 21 July 2021 for categories 8 and 9 other than in vitro diagnosticmedical devices and industrial monitoring and control instruments; - 21 July 2023 for category 8 in vitro diagnostic medical devices; - 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
18(b)-I,Lead as activator in the fluorescent powder (1 % lead by weight or less) of discharge lampscontaining phosphors such as BSP (BaSi2O5:Pb) when used in medical phototherapy equipment	Applies to categories 5 and 8, excluding applications covered byentry 34 of Annex IV, and expires on 21 July 2021.
19,Lead with PbBiSn-Hg and PbInSn-Hg in specific compositions as main amalgam and with PbSnHg as auxiliary amalgam in very compact energy saving lamps (ESL)	Expires on 1 June 2011
20,Lead oxide in glass used for bonding front and rear substrates of flat fluorescent lamps used for Liquid Crystal Displays (LCDs)	Expires on 1 June 2011
21, Lead and cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses	Applies to categories 8, 9 and 11 and expires on: - 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments; - 21 July 2023 for category 8 in vitro diagnostic medical devices; - 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
21(a),Cadmium when used in colour printed glass to provide filtering functions, used as a component in lighting applications installed in displays and control panels of EEE	Applies to categories 1 to 7 and 10 except applications covered by entry 21(b) or entry 39 and expires on 21 July 2021
21(b),Cadmium in printing inks for the application of enamels on glasses, such as borosilicate and soda lime glasses	Applies to categories 1 to 7 and 10 except applications covered by entry 21(a) or 39 and expires on 21 July 2021.
21(c),Lead in printing inks for the application of enamels on other than borosilicate glasses	Applies to categories 1 to 7 and 10 and expires on 21 July 2021.
23, Lead in finishes of fine pitch components other than connectors with a pitch of 0,65 mm and less	May be used in spare parts for EEE placed on the market before 24 September 2010
24, Lead in solders for the soldering to machined through hole discoidal and planar array ceramic multilayer capacitors	Expires on: - 21 July 2021 for categories 1-7 and 10, - 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments, - 21 July 2023 for category 8 in vitro diagnostic medical devices,- 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
25, Lead oxide in surface conduction electron emitter displays (SED) used in structural elements, notably in the seal frit and frit ring	
26,Lead oxide in the glass envelope of black light blue lamps	Expires on 1 June 2011
27,Lead alloys as solder for transducers used in high-powered (designated to operate for several hours at acoustic power levels of 125 dB SPL and above) loudspeakers	Expired on 24 September 2010

Exemptions	
Directive (EU)2017/2102 amending Annex III to Directive 2011/65/EU	
Exemption Items	**Expires Date**
29, Lead bound in crystal glass as defined in Annex I (Categories 1, 2, 3 and 4) of Council Directive 69/493/EEC ([1])	Expires on: - 21 July 2021 for categories 1-7 and 10; - 21 July 2021 for categories 8 and 9 other than in vitro diagnosticmedical devices and industrial monitoring and ontrol instruments; - 21 July 2023 for category 8 in vitro diagnostic medical devices; - 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
30, Cadmium alloys as electrical/mechanical solder joints to elec-trical conductors located directly on the voice coil in transducers used in high-powered loudspeakers with sound pressure levels of 100 dB (A) and more	
31, Lead in soldering materials in mercury free flat fluorescent lamps (which e.g. are used for liquid crystal displays, design or industrial lighting)	
32, Lead oxide in seal frit used for making window assemblies for Argon and Krypton laser tubes	Expires on: - 21 July 2021 for categories 1-7 and 10, - 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments, - 21 July 2023 for category 8 in vitro diagnostic medical devices, - 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
33, Lead in solders for the soldering of thin copper wires of 100 µm diameter and less in power transformers	
34, Lead in cermet-based trimmer potentiometer elements	Applies to all categories; expires on: - 21 July 2021 for categories 1-7 and 10, - 21 July 2021 for categories 8 and 9 other than in vitro diagnostic medical devices and industrial monitoring and control instruments, - 21 July 2023 for category 8 in vitro diagnostic medical devices, - 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
36, Mercury used as a cathode sputtering inhibitor in DC plasma displays with a content up to 30 mg per display	Expired on 1 July 2010
37, Lead in the plating layer of high voltage diodes on the basis of a zinc borate glass body	Expires on: - 21 July 2021 for categories 1-7 and 10; - 21 July 2021 for categories 8 and 9 other than in vitro diagnosticmedical devices and industrial monitoring and control instruments; - 21 July 2023 for category 8 in vitro diagnostic medical devices; - 21 July 2024 for category 9 industrial monitoring and control instruments, and for category 11.
38, Cadmium and cadmium oxide in thick film pastes used on aluminium bonded beryllium oxide	
39(a), Cadmium selenide in downshifting cadmiumbased semiconductor nanocrystal quantum dots for use in display lighting applications (< 0,2 µg Cd per mm2 of display screen area)	Expires for all categories on 31 October 2019
40, Cadmium in photoresistors for analogue optocouplers applied in professional audio equipment	Expires on 31 December 2013

Exemptions	
Directive (EU)2017/2102 amending Annex III to Directive 2011/65/EU	
Exemption Items	**Expires Date**
41, Lead in solders and termination finishes of electrical and electronic components and finishes of printed circuit boards used in ignition modules and other electrical and electronic engine control systems, which for technical reasons must be mounted directly on or in thecrankcase or cylinder of hand-held combustion engines (classes SH:1, SH:2, SH:3 of Directive 97/68/EC of the European Parliament and of the Council (2))	Applies to all categories and expires on: - 31 March 2022 for categories 1 to 7, 10 and 11; - 21 July 2021 for categories 8 and 9 other than in vitro diagnosticmedical devices and industrial monitoring and control instruments; - 21 July 2023 for category 8 in vitro diagnostic medical devices; - 21 July 2024 for category 9 industrial monitoring and control instruments.
42,Lead in bearings and bushes of diesel or gaseous fuel powered internal combustion engines applied in non-road professional use equipment:- with engine total displacement ≥ 15 litres; or - with engine total displacement < 15 litres and the engine is designed to operate in applications where the time between signal to start and full load is required to be less than 10 seconds; or regular maintenance is typically performed in a harsh and dirty outdoor environment, such as mining, construction, and agriculture applications	Applies to category 11, excluding applications covered by entry 6(c) of this Annex. Expires on 21 July 2024.
43,Bis(2-ethylhexyl) phthalate in rubber components in engine systems, designed for use in equipment that is not intended solely for consumer use and provided that no plasticised material comes into contact with human mucous membranes or into prolonged contact with human skin and the concentration value of bis(2-ethylhexyl) phthalate does not exceed: (a) 30 % by weight of the rubber for (i) gasket coatings; (ii) solid-rubber gaskets; or (iii) rubber components included in assemblies of at least three components using electrical, mechanical or hydraulic energy to do work, and attached to the engine (b) 10 % by weight of the rubber for rubbercontaining components not referred to in point (a). For the purposes of this entry, ‘prolonged contact with human skin’ means continuous contact of more than 10 minutes duration or intermittent contact over a period of 30 minutes, per day	Applies to category 11 and expires on 21 July 2024
44,Lead in solder of sensors, actuators, and engine control units of combustion engines within the scope of Regulation (EU) 2016/1628 of the European Parliament and of the Council (4), installed in equipment used at fixed positions while in operation which is designed for professionals, but also used by non-professional users	Applies to category 11 and expires on 21 July 2024.
45,Leaddiazide, lead styphnate, lead dipicramate, orange lead (lead tetroxide), lead dioxide in electric and electronic initiators of explosives for civil (professional) use and barium chromate in long time pyrotechnic delay charges of electric initiators of explosives for civil (professional) use	Applies to category 11 and expires on 20 April 2026
Note: 1. OJ L 174 1.7.2011, p.88.	

****

** Modified History **

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	2025/03/25	Jason Zhou

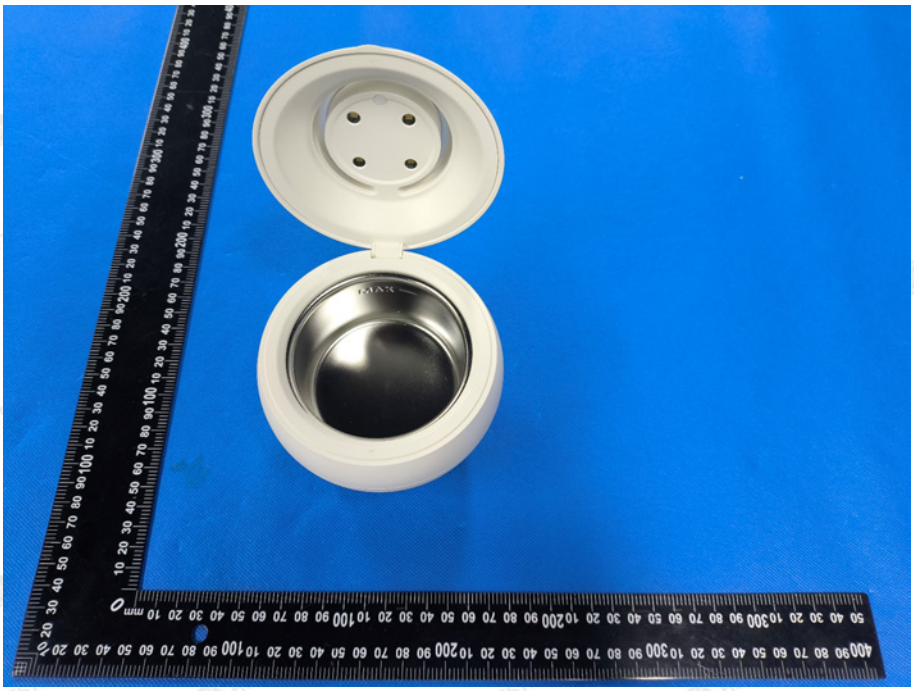
Photo(s) of the sample(s)

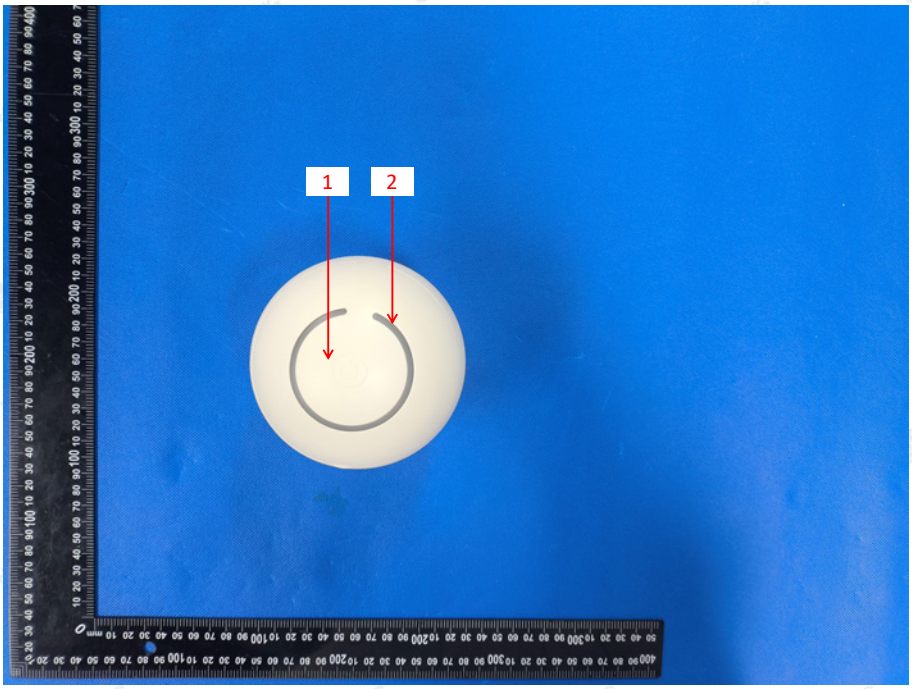
TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com

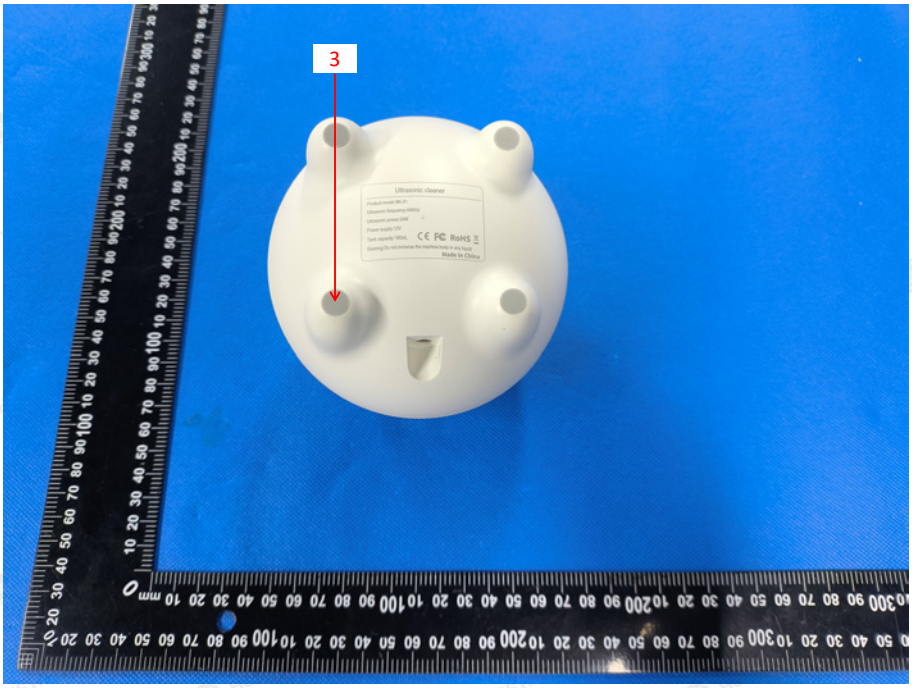
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

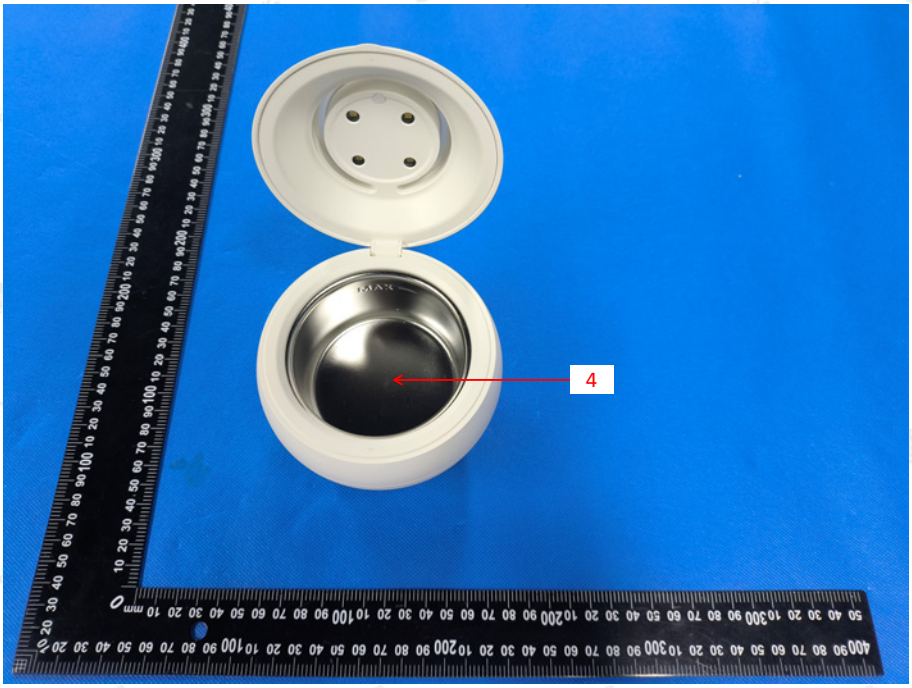
TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com

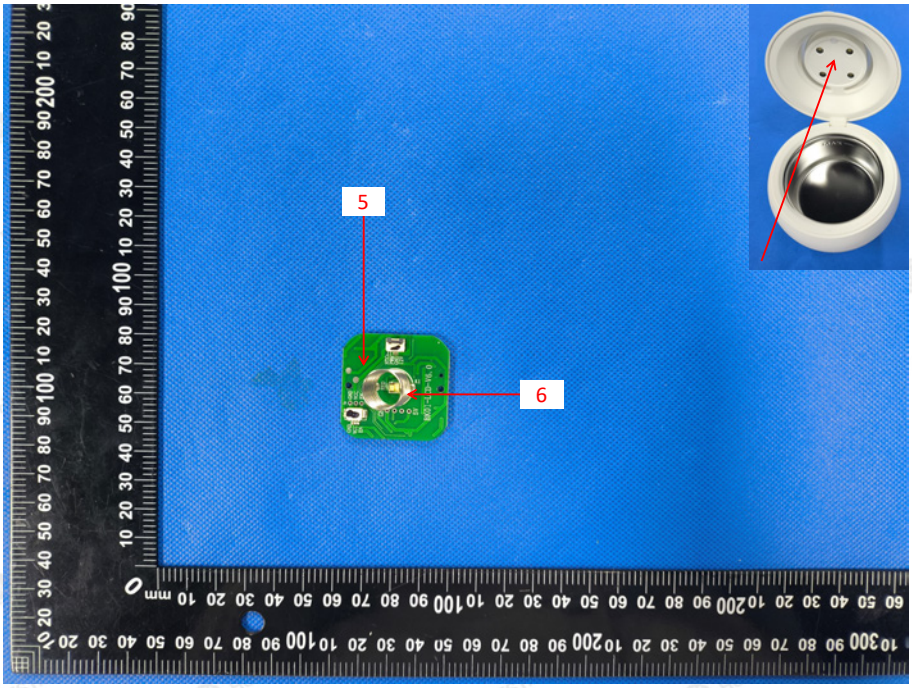
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

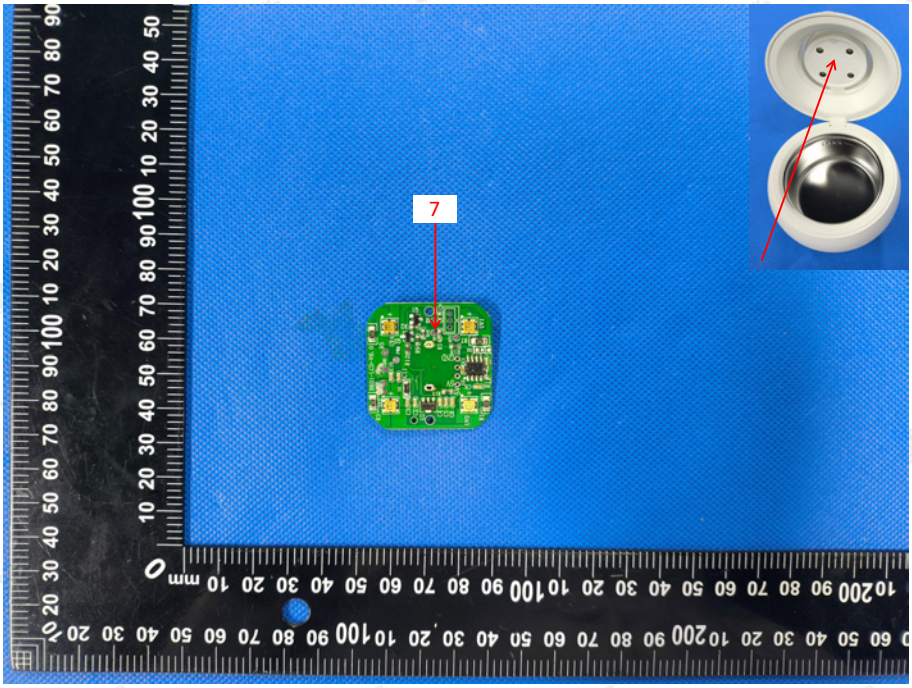






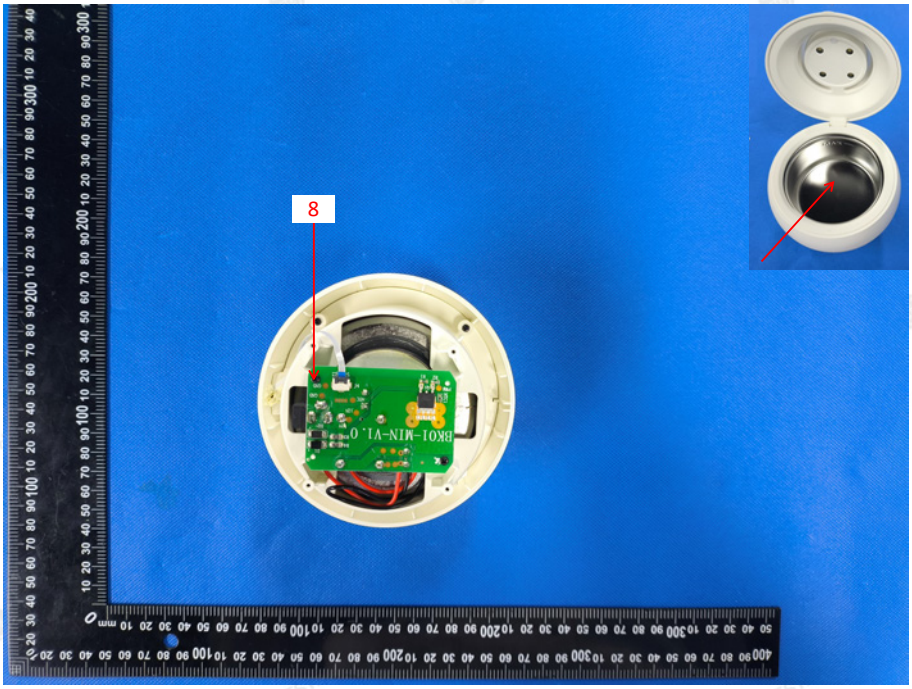


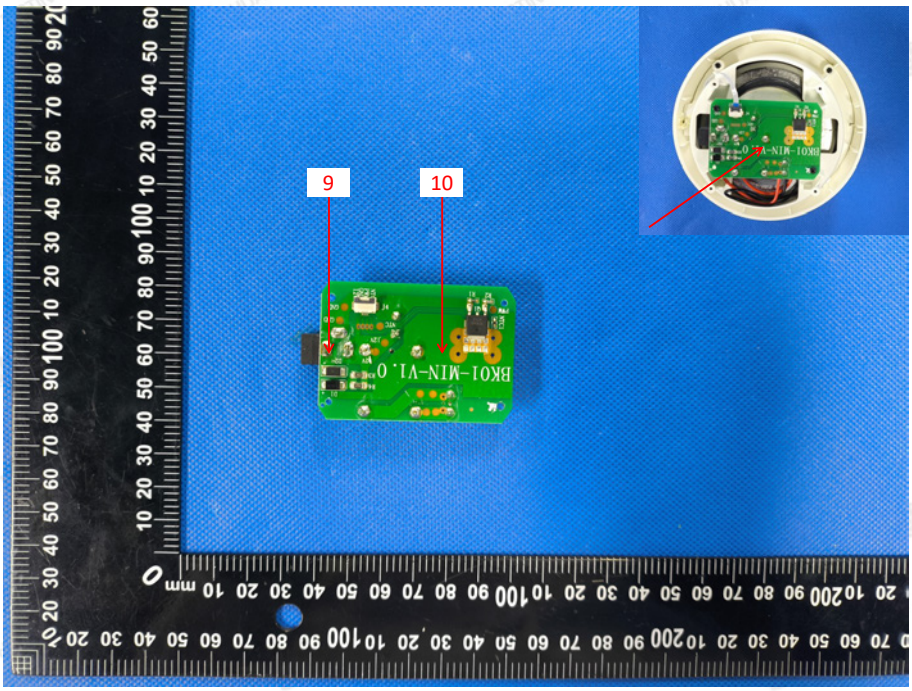




TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com

Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China





HUAK authenticate the photo on original report only

***** End of Report *****

Remark: This report is considered invalidated without the Special Seal for Inspection of the HUAK. This report shall not be altered, increased or deleted. The results shown on this test report refer only to the sample(s) tested unless otherwise stated, under the conditions agreed upon. Anyone who uses this report should understand all of the details of the engagement. Without written approval of HUAK, this test report shall not be copied except in full and published as advertisement.

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com

Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China