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CNAS L7472



APPLICATION FOR ELECTROMAGNETIC COMPATIBILITY DIRECTIVE

On Behalf of

Dongguan Dirui Electronic Technology Co., Ltd.

pet feeder

Model No.: PAF-A06

Prepared for : Dongguan Dirui Electronic Technology Co., Ltd.
Address : Room 501, building 7, No.1, Tailian lane, Chang'an Town,
Dongguan City, Guangdong Province

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TEST REPORT DECLARATION

Applicant : Dongguan Dirui Electronic Technology Co., Ltd.
 Address : Room 501, building 7, No.1, Tailian lane, Chang'an Town, Dongguan City, Guangdong Province
 Manufacturer : Dongguan Dirui Electronic Technology Co., Ltd.
 Address : Room 501, building 7, No.1, Tailian lane, Chang'an Town, Dongguan City, Guangdong Province
 EUT Description : pet feeder
 (A) Model No. : PAF-A06
 (B) Trademark : N/A

Measurement Standard Used:

- EN IEC 55014-1:2021**
- EN IEC 55014-2:2021**
- EN IEC 61000-3-2:2019+A1:2021**
- EN 61000-3-3:2013+A1:2019**

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the EN 55014-1, EN IEC 61000-3-2, EN 61000-3-3 and EN 55014 -2 requirements.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....: Ben Sun
 Project Engineer

Approved by (name + signature).....: Simple Guan
 Project Manager

Date of issue.....: April 21, 2022



Revision History

Revision	Issue Date	Revisions	Revised By
V0	April 21, 2022	Initial released Issue	Ben Sun

1. Summary Of Standards And Results

1.1. Description Of Standards And Results

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

EMISSION				
Description of Test Item	Standard	Limits	Results	
Disturbance Voltages at mains terminals	EN IEC 55014-1:2021	Section 4.3.3	P	
Disturbance power test	EN IEC 55014-1:2021	Section 4.3.4	P	
Radiated Disturbance	EN IEC 55014-1:2021	Section 4.3.4	N/A	
Harmonic current emissions	EN IEC 61000-3-2:2019+A1:2021	Section 7	N/A	
Voltage fluctuations & flicker	EN 61000-3-3:2013+A1:2019	Section 5	P	
Clicks	EN IEC 55014-1:2021	Section 4.4.2	N/A	
IMMUNITY (EN 55014 -2:2015)				
Description of Test Item	Standard	Performance Criteria	Observation Criteria	Results
Electrostatic discharge	IEC 61000-4-2:2008	B	A	P
Radio-frequency, Continuous radiated disturbance	IEC 61000-4-3:2020	A	A	P
Electrical fast transient	IEC 61000-4-4:2012	B	A	P
Surge	IEC 61000-4-5:2014+A1:2017	B	A	P
Radio-frequency, Continuous conducted disturbance	IEC 61000-4-6:2013	A	A	P
Voltage dips, Interruptions	IEC 61000-4-11:2020	C	A	P
Voltage dips , 60% reduction		C	B	P
Voltage dips, 30% reduction		C	B	P
Note:	1. P is an abbreviation for Pass. 2. F is an abbreviation for Fail. 3. N/A is an abbreviation for Not Applicable. 4. The conclusion of this test report is judged by actual test data without considering measurement uncertainty.			

2. General Information

2.1. Description Of Device (EUT)

Description : pet feeder

Model Number : PAF-A06

Diff : /

Highest Frequency : Less than 15MHz

Test Voltage : AC 230V/50Hz

EUT information : Input : 100-240V~ 50/60Hz

Trademark : N/A

Software version : N/A


Hardware version : N/A

2.2. Accessories Of Device (EUT)

Power Source : Power from AC Mains

Model : PSD-0501000EU

Input : 100-240V~ 50/60Hz 0.5A (Max)

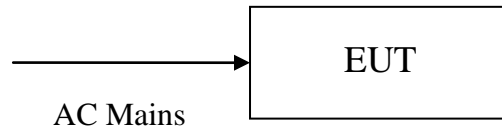
Output : 5V 4.0A

2.3. Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number
1	N/A	N/A	N/A	N/A

2.4. Block Diagram Of Connection Between EUT And Simulators

For EMI & EMS test



EUT: pet feeder

2.5. Test Mode Information

For test

No.	Test Mode	Test Voltage
※1.	Working	AC 230V/50Hz
2.	Standby	AC 230V/50Hz
3.	Working	AC 120V/60Hz
4.	Standby	AC 120V/60Hz

Note: ※1 is worst case mode tests, so this report only reflected the worst mode in this part.

2.6. Test Facility

Shenzhen Alpha Product Testing Co., Ltd.

Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

2.7. Measurement Uncertainty

(95% confidence levels, k=2)

Item	MU	Remark
Uncertainty for Conducted Emission Test	2.74dB	
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.85dB	Polarize: V Polarize: H
	3.87dB	
Uncertainty for Power Clamp Test	4.5 dB	

2.8. Test Equipment List

For Conducted Disturbance At Mains Terminals Test Equipment:						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI	101165	2021.08.25	1 Year
2.	L.I.S.N.#1	Schwarz beck	NSLK8126	8126466	2021.08.25	1 Year
3.	L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	101043	2021.08.25	1 Year
4.	Pulse Limiter	Schwarz beck	9516F	9618	2021.08.25	1 Year

For Frequency Range 30MHz~1GHz Radiated Emission Test Equipment:						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Test Receiver	Rohde&Schwarz	ESR	1316.3003K03-102082-Wa	2021.08.25	1 Year
3	Bilog Antenna	Schwarz beck	VULB 9168	9168-627	2020.04.12	2 Year

For Disturbance Power Test Equipment:						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI	101165	2021.08.25	1 Year
2	Absorbing Clamp	Liithi	MDS-21	4054	2021.08.30	1 Year

3	N50(f-m) 6dB Fixed Attenuator	Rohde & Schwarz	A0835	J01006A0 835	2021.08.25	1 Year
4	RF Cable	Resenberger	Cable 4	N/A	2021.08.25	1 Year

For Harmonic Current Test & Voltage Fluctuations & Flicker Test Equipment:

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Harmonics Flicker Analyser	Voltech	PM6000	200006700495	2021.08.25	1 Year

For Electrostatic Discharge Test Equipment:

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Tester	HAEFELY	PESD1610	H310546	2021.08.25	1 Year

For RF Field Strength Susceptibility Test Equipment:

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	vector Signal Generator	Agilent	E4438C	US4427191 7	2021.08.25	1 Year
2.	Power meter	Agilent	E4419B	GB4020212 2	2021.08.25	1 Year
3.	Power Sensor	Agilent	E9300A	MY414966 25s	2021.08.25	1 Year
4.	RF power Amplifier	OPHIR	5225R	1045	2021.08.25	NCR
5.	RF power Amplifier	OPHIR	5273R	1018	2021.08.25	NCR
6	RF power Amplifier	Micotop	MPA-3000-6 000-100	MPA18113 48	2021.08.25	NCR
7.	Antenna	SCHWARZBE CK	STLP9128E- special	STLP9128E s#139	N/A	NCR
8.	Antenna	SCHWARZBE CK	STLP 9149	STLP 9149 #456	N/A	NCR

For Electrical Fast Transient/Burst Immunity, Surge, Power Frequency Magnetic Field Immunity, Voltage dips and interruptions test Equipment:						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Multifunctional Compact Immunity Test system	3ctest	CCS 600	ES0801655	2021.08.27	1 Year
2.	Surge & EFT Coupling Decoupling Network	3ctest	SEPN 3832T	ES0951601	2021.08.25	1 Year
3.	Voltage variation and PF magnetic field regulating device	3ctest	VMT2216S	ES0441601	2021.08.27	1 Year
4.	Capacitive Coupling Clamp	3ctest	CCC 100	EC0441660	2021.08.25	1 Year

For Injected currents susceptibility test Equipment:						
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Conducted Immunity test System	SKET	CITS_150K 230M	SK2019101 001_CITS	2021.08.27	1 Year
2.	Fixed Coaxial Attenuator (6dB Attenuation)	CD	ATT-0675	120540086	2021.08.25	1 Year
3.	coupling-decoupling network (CDN)	CD	CDN M2/M3	2302	2021.08.25	1 Year
4.	Electromagnetic Injection Clamp (EMC-Clamp)	CD	EM-Clamp	0513A0312 01	2021.08.25	1 Year

Software Information			
Test Item	Software Name	Manufacturer	Version
RE	EZ-EMC	EZ	Alpha-3A1
CE	EZ-EMC	EZ	Alpha-3A1
RF-CE	MTS 8310	MW	V2.0.0.0

2.9. Classification Of Apparatus Description

Category I: apparatus containing no electronic control circuitry.

Electric circuits consisting of passive components (such as radio interference suppression capacitors or inductors, mains transformers and mains frequency rectifiers) are not considered to be electronic control circuitry.

Category II: transformer toys, dual supply toys, mains powered motor operated appliances, tools, Working appliances and similar electric apparatus (for example — UV radiators, IR radiators and microwave ovens) containing electronic control circuitry with no internal clock frequency or oscillator frequency higher than 15 MHz.

Note: For toys, examples include educational computers, organs, track sets with electronic control units.

Category III: battery powered apparatus (with built-in batteries or external batteries), which in normal use is not connected to the mains, containing an electronic control circuitry with no internal clock frequency or oscillator frequency higher than 15 MHz.

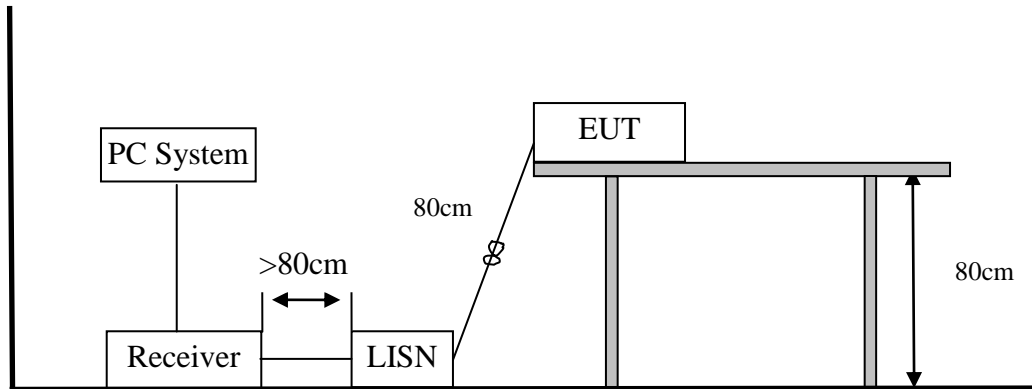
This category includes apparatus provided with rechargeable batteries which can be charged by connecting the apparatus to the mains power. However, this apparatus shall also be tested as an apparatus in Category II while it is connected to the mains network.

Note: For toys, examples include musical soft toys, cord-controlled toys and motor-operated electronic toys.

Category IV: all other apparatus covered by the scope of the standard (EN 55014-2).

3. Conducted Disturbance At mains Terminals Test

3.1. Block Diagram Of Test Setup



3.2. Test Standard

EN55014-1:2017

3.3. Power Line Conducted Emission Test Limits

Mains Ports		
Frequency	At mains terminals (dB μ V)	
	Quasi-peak Level	Average Level
150kHz ~ 500kHz	66 ~ 56 *	59 ~ 46 *
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

- Notes:
1. Emission level=Read level + LISN factor-Preamplifier factor + Cable loss
 2. * Decreasing linearly with logarithm of frequency.
 3. The lower limit shall apply at the transition frequencies.

3.4. Configuration Of EUT On Test

The following equipment are installed on conducted disturbance at mains terminals to meet the EN 55014-1 requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

3.5. Operating Condition Of EUT

- (1) Setup the EUT as shown as Section 3.2.
- (2) Turn on the power of all equipment.
- (3) Let the EUT work in test mode and 15 minutes before taking the test.

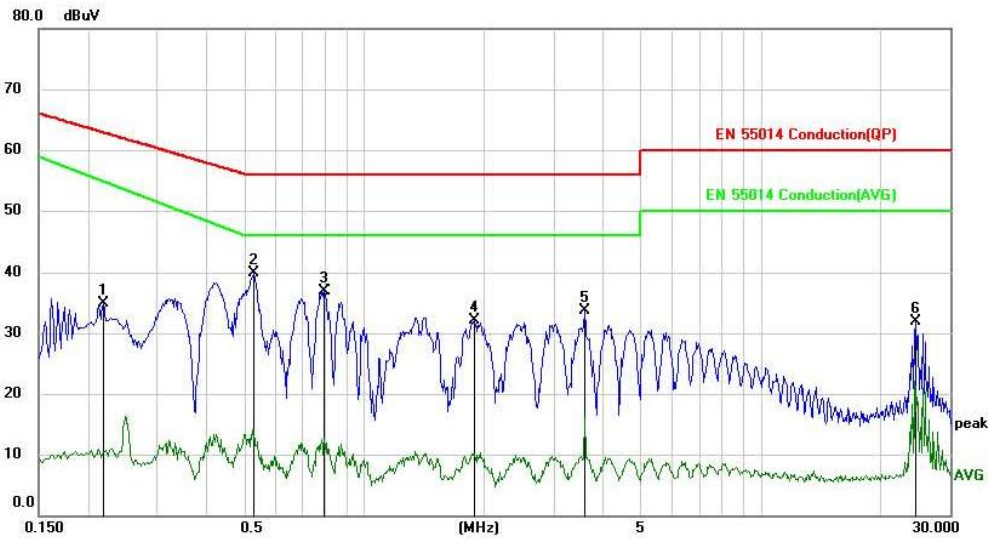
3.6. Test Procedure

- (1) The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. #1). The power line was checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to EN 55014-1 on Conducted Disturbance at Mains Terminals test.
- (2) The bandwidth of test receiver (R & S ESCI) is set: 9kHz at 150kHz to 30MHz.
- (3) The frequency range from 150kHz to 30MHz is checked. The test result is reported on Section 3.8.

3.7. Conducted Disturbance At Mains Terminals Test Result

EUT : pet feeder	Test Date : 2022.4.18
M/N : PAF-A06	Temperature : 24°C
Test Engineer : Ben Sun	Humidity : 56%
Test Voltage : AC 230V/50Hz	Pressure : 101.6kPa
Test Mode : Working	
Test Results : PASS	
<p>Note: 1. The test results are listed in next pages.</p> <p>2. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector and quasi-peak detector need not be carried out.</p> <p>3. If the limits for the measurement with the average detector are met when using a receiver with a quasi-peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.</p>	

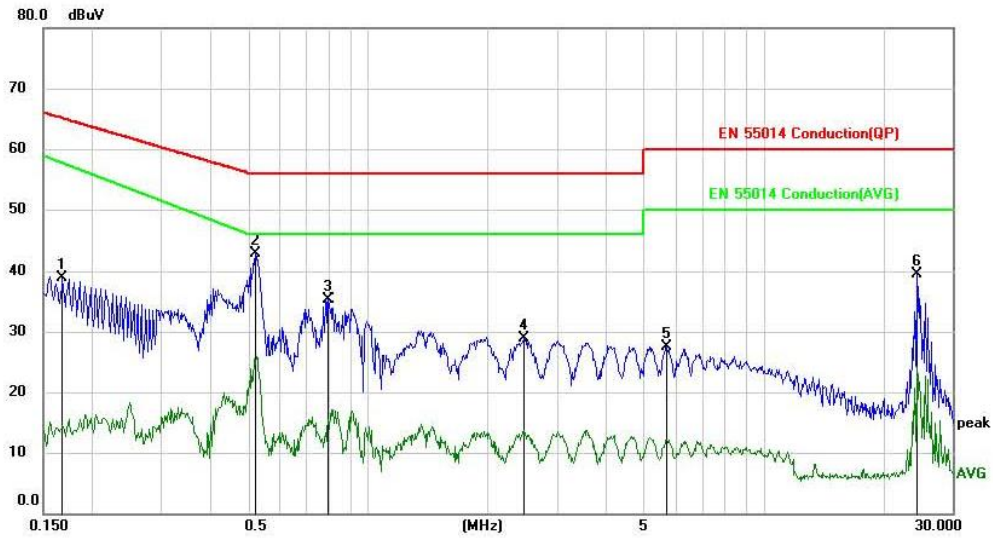
Polarization: Line



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.2190	25.04	9.94	34.98	62.86	-27.88	peak	
2	*	0.5280	29.91	9.95	39.86	56.00	-16.14	peak	
3		0.7920	26.89	9.94	36.83	56.00	-19.17	peak	
4		1.8900	22.24	9.88	32.12	56.00	-23.88	peak	
5		3.5880	23.84	9.96	33.80	56.00	-22.20	peak	
6		24.5340	21.38	10.44	31.82	60.00	-28.18	peak	

*:Maximum data x:Over limit !:over margin (Reference Only)
 Note: Measurement=Reading Level+Correc Factor.. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

Polarization: Neutral



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1680	28.90	9.93	38.83	65.06	-26.23	peak	
2	*	0.5190	33.05	9.95	43.00	56.00	-13.00	peak	
3		0.7950	25.45	9.94	35.39	56.00	-20.61	peak	
4		2.4720	18.97	9.91	28.88	56.00	-27.12	peak	
5		5.6940	17.39	10.07	27.46	60.00	-32.54	peak	
6		24.3510	29.16	10.44	39.60	60.00	-20.40	peak	

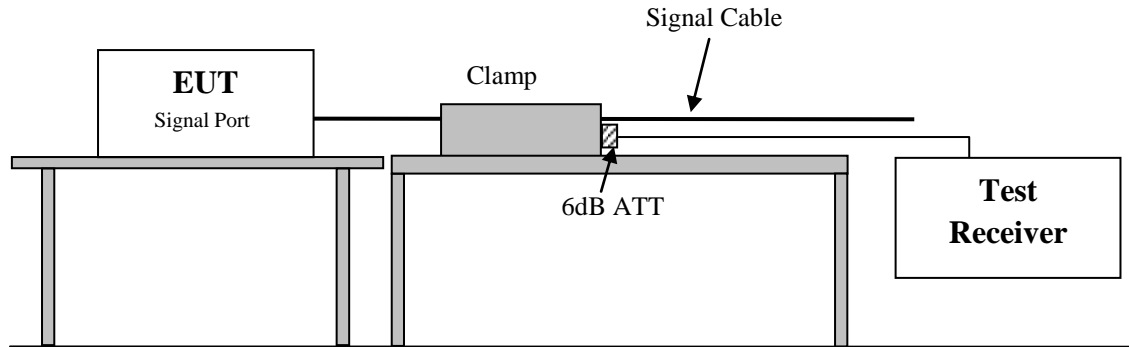
*:Maximum data x:Over limit !:over margin

(Reference Only)

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

4. Disturbance Power Test

4.1. Block Diagram Of Test Setup



4.2. Test Standard

EN55014-1:2017

4.3. Radiated Electromagnetic Disturbance Limits

Frequency MHz	Interference Power Limits (dBpW)	
	Quasi-peak Value	Average Value
30 ~ 300	45 Increasing Linearly with Frequency to 55	35 Increasing Linearly with Frequency to 45

Notes: Emission level=Read level +LISN factor-Preamp factor +Cable loss

4.4. EUT Configuration On Test

The EN55014-1 regulations test method must be used to find the maximum emission during radiated power test. Any lead connecting the EUT to an auxiliary apparatus is disconnected if this does not affect the operation of the EUT, or is isolated by means of absorbing clamp close to the EUT, a similar measure was made on each lead which is or may be connected to an auxiliary apparatus, whether or not it is necessary for the operation of the EUT.

4.5. Operating Condition Of EUT

Same as conducted test which is listed in section 4.6. Except the test setup is replaced by section 4.2.

4.6. Test Procedure

The EUT is placed on the table which is high 0.8m by insulating support and away from other metallic surface at least 0.8m. It is connected to the power mains through an extension cord of 6m minimums. The absorber clamp was clamps the cord and moves from the far end to EUT to measure the disturbing energy emitted from the cord.

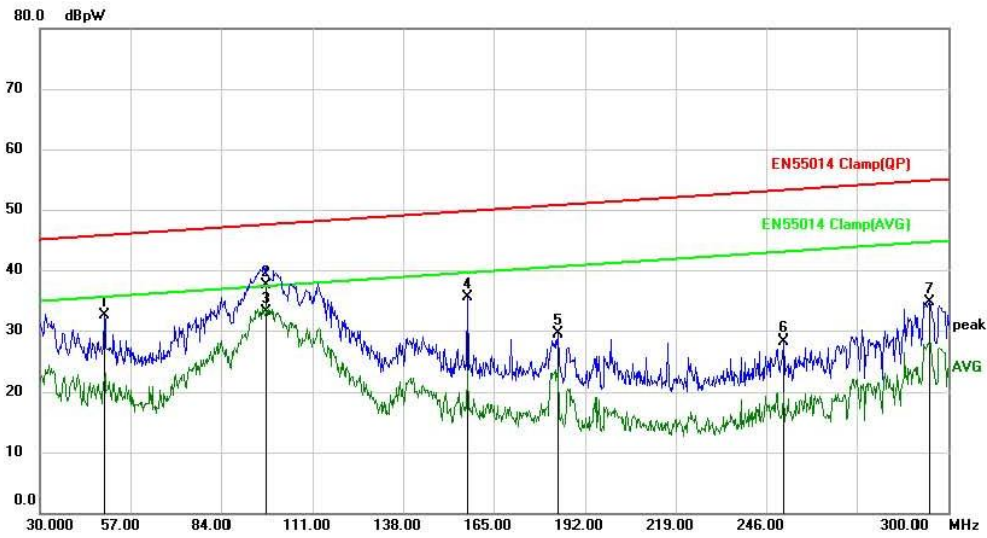
The bandwidth of the field strength meter (Rohde&Schwarz Test Receiver ESCI) is set at 120kHz.

The frequency range from 30MHz to 300MHz is checked. All the test results are listed in Section 4.8

4.7. Disturbance Power Test Result

EUT	: pet feeder	Test Date	: 2022.4.18
M/N	: PAF-A06	Temperature	: 24°C
Test Engineer	: Ben Sun	Humidity	: 56%
Test Voltage	: AC 230V/50Hz	Pressure	: 101.6kPa
Test Mode	: Working		
Test Results	: PASS		
Note:	<ol style="list-style-type: none">1. The test results are listed in next pages.2. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector and quasi-peak detector need not be carried out.3. If the limits for the measurement with the average detector are met when using a receiver with a quasi-peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.		

Polarization: DC

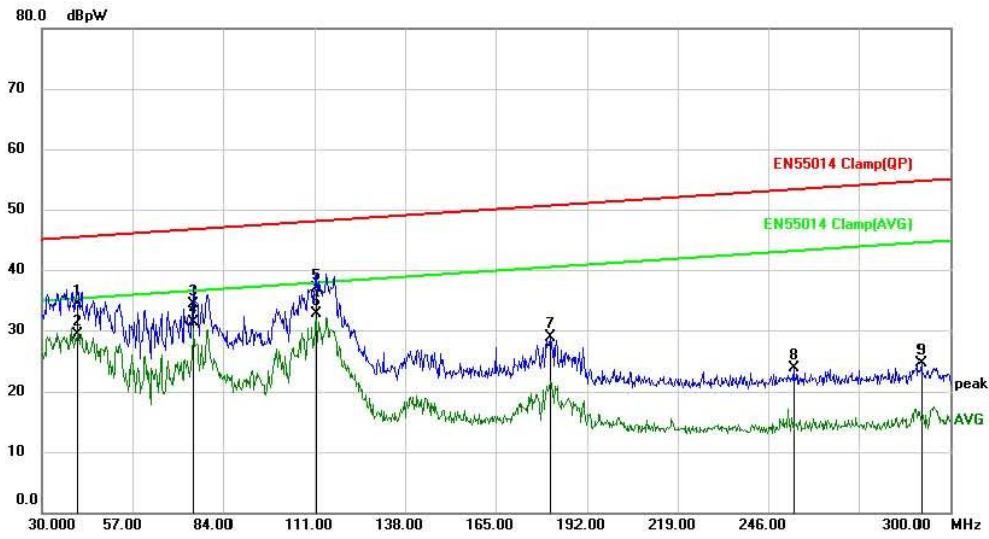


No.	Mk.	Freq. MHz	Reading Level dBpW	Correct Factor dB	Measure- ment dBpW	Limit dBpW	Margin dB	Detector	Position cm	Comment
1		49.4000	14.49	17.95	32.44	45.72	-13.28	peak		
2		97.0800	20.53	17.03	37.56	47.48	-9.92	QP		
3	*	97.0800	16.02	17.03	33.05	37.48	-4.43	AVG		
4		157.2400	19.86	15.56	35.42	49.71	-14.29	peak		
5		184.2400	14.74	14.77	29.51	50.71	-21.20	peak		
6		251.2800	13.79	14.55	28.34	53.20	-24.86	peak		
7		294.5200	19.68	14.97	34.65	54.80	-20.15	peak		

*:Maximum data x:Over limit l:over margin (Reference Only)

Note: Measurement=Reading Level+Correc Factor. Factor=CLAMP Factor+Cable Loss+Attenuator.

Polarization: AC



No.	Mk.	Freq. MHz	Reading Level dBpW	Correct Factor dB	Measure- ment dBpW	Limit dBpW	Margin dB	Detector	Position cm	Comment
1		40.7599	15.02	19.23	34.25	45.40	-11.15	QP		
2		40.7599	10.17	19.23	29.40	35.40	-6.00	AVG		
3		75.1200	17.29	16.96	34.25	46.67	-12.42	QP		
4		75.1200	14.29	16.96	31.25	36.67	-5.42	AVG		
5		111.6800	20.14	16.73	36.87	48.03	-11.16	QP		
6	*	111.6800	16.04	16.73	32.77	38.03	-5.26	AVG		
7		181.3600	13.95	14.90	28.85	50.61	-21.76	peak		
8		253.6000	9.26	14.60	23.86	53.28	-29.42	peak		
9		291.5200	9.69	14.97	24.66	54.69	-30.03	peak		

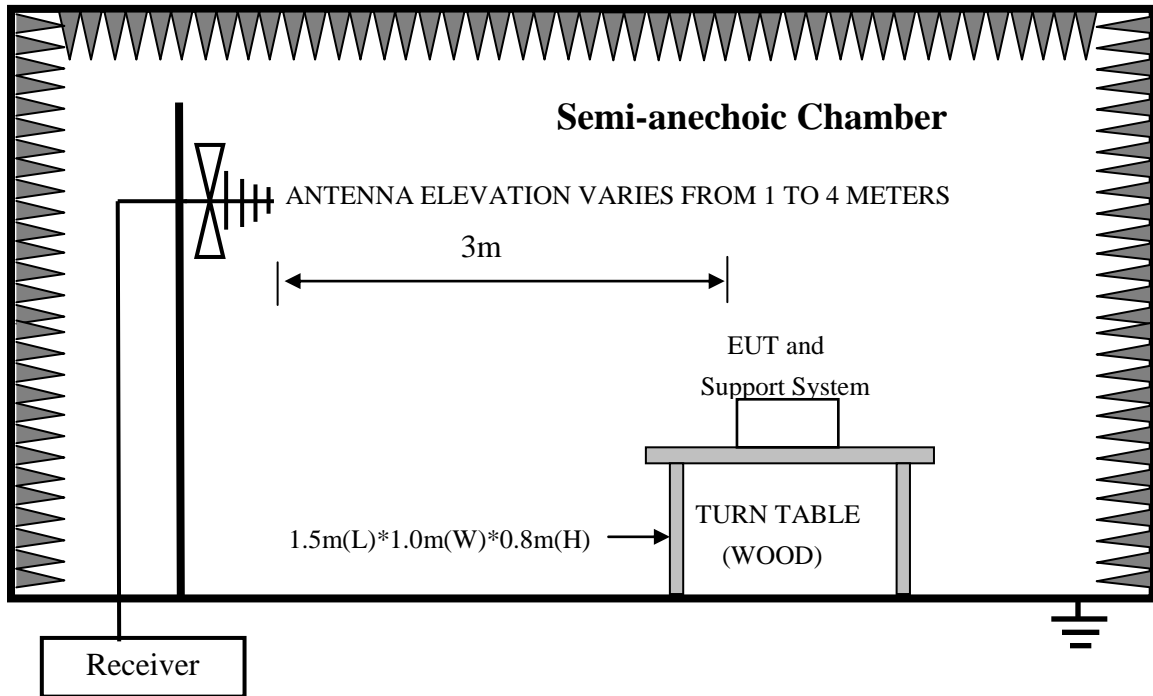
*:Maximum data x:Over limit o:over margin (Reference Only)

Note: Measurement=Reading Level+Correc Factor. Factor=CLAMP Factor+Cable Loss+Attenuator.

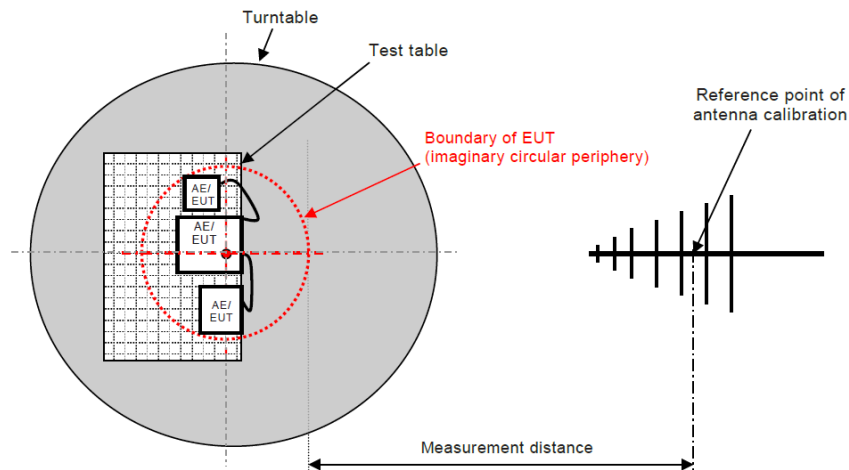
5. Radiated Disturbance Test

5.1. Block Diagram Of Test Setup

In Semi Anechoic Chamber (3m) Test Setup Diagram for 30MHz~1000MHz



For 3m distance description:



5.2. Test Standard

EN55014-1:2017

5.3. Radiated Disturbance Limit

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

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMITS (dB μ V/m)
30 ~ 230	3	40
230 ~ 1000	3	47

- Note: (1) Emission level = Read level + Antenna Factor-Preamp Factor +Cable Loss
(2) The lower limit shall apply at the transition frequencies.
(3) Distance refers to the distance in meters between the test antenna and the closed point of any part of the EUT.

5.4.Configuration Of EUT On Test

The following equipment are installed on Radiated Emission Test to meet the EN 55014-1 requirements and operating regulations in a manner that tends to maximize its emission characteristics in normal application.

5.5.Operating Condition Of EUT

- (1) Setup the EUT as shown as Section 5.2.
- (2) Turn on the power of all equipment.
- (3) Let the EUT work in test mode and 15 minutes before taking the test.

5.6.Test Procedure

The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber. An antenna was located 3m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to EN 55014-1 on Radiated Disturbance test.

The bandwidth setting on the test receiver (R&S TEST RECEIVER ESR) is 120 kHz. The frequency range from 30MHz to 1000MHz is checked. Test results are reported in Section 5.8.

5.7.Radiated Disturbance Test Result

EUT	: pet feeder	Test Date	: N/A
M/N	: PAF-A06	Temperature	: N/A
Test Engineer	: N/A	Humidity	: N/A
Test Voltage	: N/A	Pressure	: N/A
Test Mode	: N/A		
Test Results	: N/A		
Note: 1. The selected power harassment is the harassment test item			

6. Clicks

The EUT which fulfill the following condition:

- the click rate is no more than 5;
- none of the caused clicks has duration longer than 20 ms,
- 90% of the caused clicks have a duration less than 10 ms (measured duration time is 0.4ms), was deemed to comply with the limits.

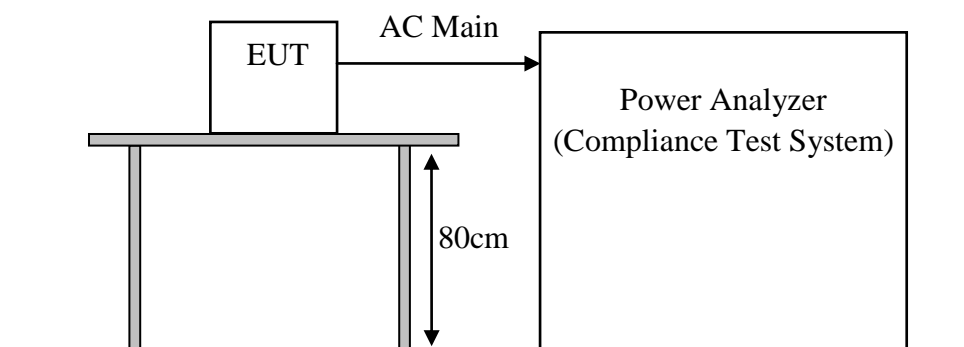
The disturbance from individual switching operations, caused directly or indirectly, manually or by similar activities on a switch or a control which is included in an appliance or otherwise to be used for:

- a) the purpose of mains connection or disconnection only;
- b) the purpose of programmer selection only;
- c) the control of energy or speed by switching between a limited number of fixed positions;
- d) the changing of the manual setting of a continuously adjustable control such as a variable speed device for water extraction or electronic thermostats, is to be disregarded for the purpose of testing the appliance for compliance with the limits of radio disturbance set out in this standard.

Also the disturbance caused by the operation of any switching device or control which is included in an appliance for the purpose of mains disconnection for safety only, is to be disregarded for the purpose of testing the appliance for compliance with the limits of radio disturbance as described in this standard.

7. Harmonic Current Test

7.1. Block Diagram Of Test Setup



7.2. Test Standard

EN IEC 61000-3-2:2019+A1:2021, Class A

7.3. Harmonic Current Test Limits

Harmonic order n	Maximum permissible harmonic current A
Odd harmonics	
3	2,30
5	1,14
7	0,77
9	0,40
11	0,33
13	0,21
$15 \leq n \leq 39$	$0,15 \frac{15}{n}$
Even harmonics	
2	1,08
4	0,43
6	0,30
$8 \leq n \leq 40$	$0,23 \frac{8}{n}$

7.4. Configuration Of EUT On Test

The following equipment are installed on Harmonic Current Test to meet the EN IEC 61000-3-2 requirements and operating regulations in a manner that tends to maximize its emission characteristics in normal application.

7.5. Operating Condition Of EUT

- (1) Setup the EUT as shown as Section 6.2.
- (2) Turn on the power of all equipment.
- (3) Let the EUT work in test mode and 15 minutes before taking the test.

7.6. Test Procedure

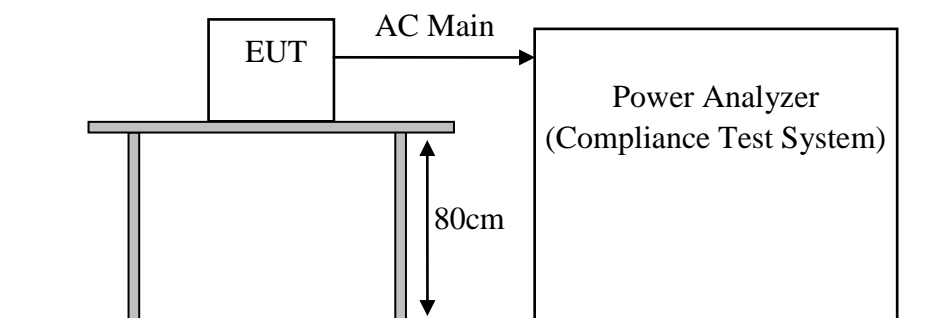
- (1) The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions for each successive harmonic component in turn. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the necessary for the EUT to be exercised.
- (2) The test results are reported on Section 7.8.

7.7. Harmonic Current Test Results

EUT : pet feeder	Test Date : N/A
M/N : PAF-A06	Temperature : N/A
Test Engineer : N/A	Humidity : N/A
Test Voltage : N/A	Pressure : N/A
Test Mode : N/A	
Test Results : N/A	
Note: No testing required according to specification	

8. Voltage Fluctuations & Flicker Test

8.1. Block Diagram Of Test Setup



8.2. Test Standard

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

8.3. Voltage Fluctuation And Flicker Test Limits

Test Item	Limit	Note
P_{st}	1.0	P_{st} means Short-term flicker indicator
P_{lt}	0.65	P_{lt} means long-term flicker indicator
T_{dt}	0.2	T_{dt} means maximum time that dt exceeds 3%
$d_{max}(\%)$	4%	d_{max} means maximum relative voltage change.
$d_c(\%)$	3.3%	d_c means relative steady-state voltage change.

8.4. Configuration Of EUT On Test

The following equipment are installed on Harmonic Current Test to meet the EN61000-3-3 requirements and operating regulations in a manner that tends to maximize its emission characteristics in normal application.

8.5. Operating Condition Of EUT

- (1) Setup the EUT as shown as Section 8.2.
- (2) Turn on the power of all equipment.
- (3) Let the EUT work in test mode and 15 minutes before taking the test.

8.6. Test Procedure

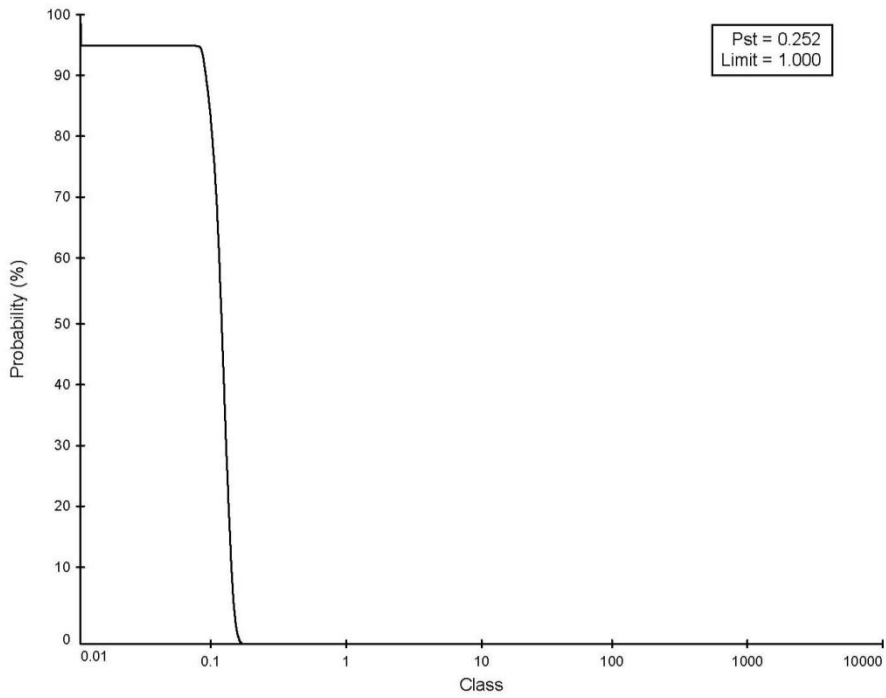
- (1) The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the most unfavorable sequence of voltage changes under normal conditions During the flick measurement; the measure time shall include that part of whole operation changes. The observation period for short-term flicker indicator is 10 minutes and the observation period for long-term flicker indicator is 2 hours.
- (2) The test results are reported on Section 8.8.

8.7.Voltage Fluctuation And Flicker Test Results

EUT : pet feeder	Test Date : 2022.4.18
M/N : PAF-A06	Temperature : 24°C
Test Engineer : Ben Sun	Humidity : 56%
Test Voltage : AC 230V/50Hz	Pressure : 101.6kPa
Test Mode : Working	
Test Results : PASS	
Note: 1. The test results are listed in next pages.	

Type of Test:	Flickermeter Test - Pst Curve
Power Analyzer:	Voltech PM6000 SN: 200006700495 Firmware Version: v1.22.07RC6
Channel(s):	1. SN: 090015501951, 28 Adjusted Date: 16 APR 2013. 2. SN:None Adjusted Date:None 3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None
Shunt(s):	1. SN: 091024301771, 4 Adjusted Date: 16 APR 2013. 2. SN:None Adjusted Date:None 3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None
AC Source:	Mains / Manual Source
Overall Result:	Notes: Measurement method - Voltage
PASS	

Pst Curve 1



Type of Test:	Flickermeter Test - Table
Power Analyzer:	Voltech PM6000 SN: 200006700495 Firmware Version: v1.22.07RC6
Channel(s):	1. SN: 090015501951, 28 Adjusted Date: 16 APR 2013. 2. SN:None Adjusted Date:None 3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None
Shunt(s):	1. SN: 091024301771, 4 Adjusted Date: 16 APR 2013. 2. SN:None Adjusted Date:None 3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None
AC Source:	Mains / Manual Source
Overall Result:	Notes: Measurement method - Voltage
PASS	

	Pst	dc (%)	dmax (%)	d(t) > 3.3%(ms)
Limit	1.000	3.300	4.000	500
Reading 1	0.252	0.000	0.874	0

9. Immunity Performance Criteria

Performance Level

The test results shall be classified in terms of the loss of function or degradation of performance of the equipment under test, relative to a performance level by its manufacturer or the requestor of the test, or the agreed between the manufacturer and the purchaser of the product.

Definition related to the performance level:

1. Based on the used product standard
2. Based on the declaration of the manufacturer, requestor or purchaser

Criterion A:

The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. 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 from what the user may reasonably expect from the apparatus if used as intended.

Criterion B:

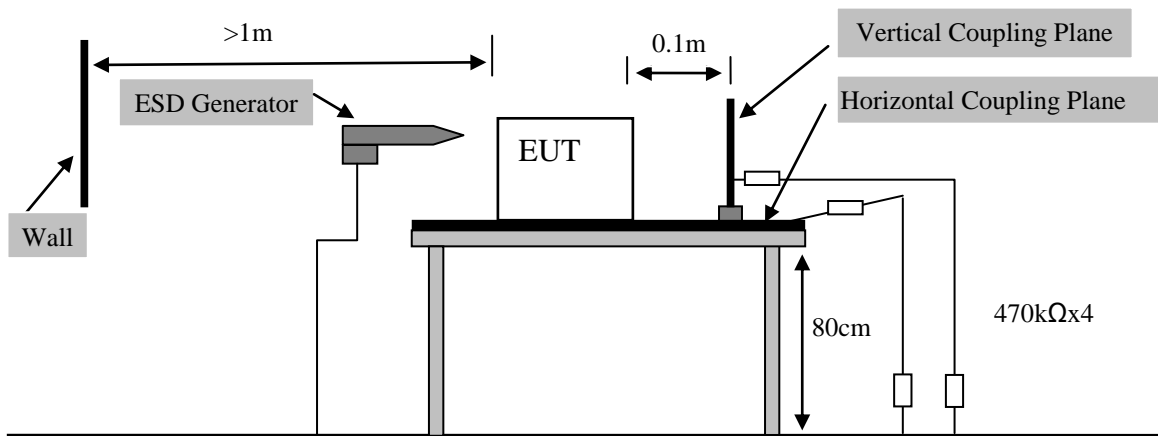
The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however no change of actual operating state or stored data is allowed to persist after the test. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

Criterion C:

Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

10. Electrostatic Discharge Test

10.1. Block Diagram Of Test Setup



10.2. Test Standard

EN 55014 -2:2015 (IEC 61000-4-2:2008)

10.3. Electrostatic Discharge Test Limits

Test Type	Test Level	Performance Criterion
Air Discharge	8KV	B
Contact Discharge	4KV	B

- Notes:
1. A performance criterion C could be applied to toys not using score or data entered by the user. Examples are musical soft toys, sounding toys, etc.
 2. Test set-up reference IEC 61000-4-2:2008

10.4. Configuration Of EUT On Test

The following equipment are installed on Electrostatic Discharge Test to meet the IEC 61000-4-2 requirements and operating regulations in a manner that tends to maximize its emission characteristics in normal application.

10.5. Operating Condition Of EUT

- (1) Setup the EUT as shown as Section 10.2.
- (2) Turn on the power of all equipment.
- (3) Let the EUT work in test mode and 15 minutes before taking the test.

10.6. Test Procedure

(1) Air Discharge:

The test was applied on non-conductive surfaces of EUT. The round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT. After each discharge, the discharge electrode was removed from the EUT. The generator was re-triggered for a new single discharge and repeated 20 times for each pre-selected test point. This procedure was repeated until all the air discharge completed

(2) Contact Discharge:

All the procedure was same as Section 9.7.1. Except that the generator was re-triggered for a new single discharge for each pre-selected test point. The tip of the discharge electrode was touching the EUT before the discharge switch was operated.

(3) Indirect discharge for horizontal coupling plane:

At least 20 single discharges were applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

(4) Indirect discharge for vertical coupling plane:

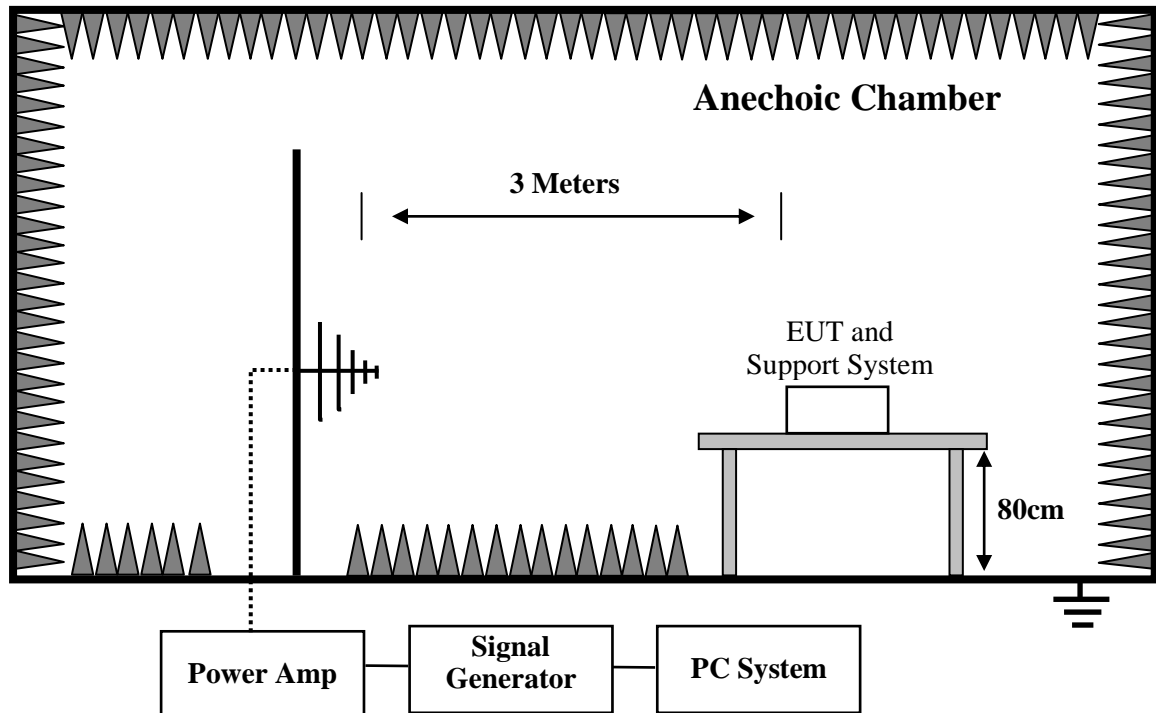
At least 20 single discharges were applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, was placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges were applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

10.7. Electrostatic Discharge Test Results

EUT	: pet feeder	Test Date	: 2022.4.19	
M/N	: PAF-A06	Temperature	: 24°C	
Test Engineer	: Ben Sun	Humidity	: 56%	
Test Voltage	: AC 230V/50Hz	Pressure	: 101.6kPa	
Test Mode	: Working			
Test Results	: PASS			
Discharge Voltage (kV)	Type Of Discharge	Dischargeable Points	Performance	
			Required	Observation
±4	Contact	/	B	/
±8	Air	1, 2, 3	B	A
±4	HCP-Bottom	Edge of the HCP	B	A
±4	VCP-Front	Center of the VCP	B	A
±4	VCP-Left	Center of the VCP	B	A
±4	VCP-Back	Center of the VCP	B	A
±4	VCP-Right	Center of the VCP	B	A
Discharge Points Description				
<u>1</u>	Button	<u>5</u>		
<u>2</u>	Gap	<u>6</u>		
<u>3</u>	Display	<u>7</u>		
<u>4</u>		<u>8</u>		
Note:	<p>1. For the time interval between successive single discharges an initial value of one second.</p> <p>2. For Air Discharge each Point Positive 10 times and negative 10 times discharge.</p> <p>3. For Contact Discharge each point positive 10 times and negative 10 times discharge.</p> <p>4. Class A is no function loss.</p> <p>5. EUT does not contain metal contact points, not need to contact discharge measurement</p>			

11. RF Field Strength Susceptibility Test

11.1. Block Diagram Of Test Setup



11.2. Test Standard

EN 55014 -2: 2015 (IEC 61000-4-3:2020)

11.3. RF Field Strength Susceptibility Test Limits

Test Specifications	Test Level	Performance Criterion
80MHz-1000MHz	3V/m (r.m.s.)	A

Notes: 1. Test set-up reference IEC 61000-4-3:2020

11.4. Configuration Of EUT On Test

The following equipment are installed on Electrostatic Discharge Test to meet the IEC 61000-4-3 requirements and operating regulations in a manner that tends to maximize its emission characteristics in normal application.

11.5. Operating Condition Of EUT

- (1) Setup the EUT as shown as Section 11.2.
- (2) Turn on the power of all equipment.
- (3) Let the EUT work in test mode and 15 minutes before taking the test.

11.6. Test Procedure

- (1) Testing was performed in a Fully anechoic chamber as recommended by IEC 61000-4-3. The EUT was placed on an 80 cm high non-conductive table located in the area of field uniformity. The radiating antenna was placed 3m in front of the EUT and Support system, and dwell time of the radiated interference was controlled by an automated, computer-controlled system.
- (2) The signal source was stepped through the applicable frequency range at a rate no faster than 1% of the fundamental. The signal was amplitude modulated 80% over the frequency range 80 MHz to 1GHz at a level of 3 V/m. The dwell time was set at 3 s.
- (3) Field presence was monitored during testing via a field probe placed in close proximity to the EUT.
- (4) Throughout testing, the EUT was closely monitored for signs of susceptibility. The test was performed with the antennae oriented in both a horizontal and vertical polarization.
- (5) All the scanning conditions are as follows:

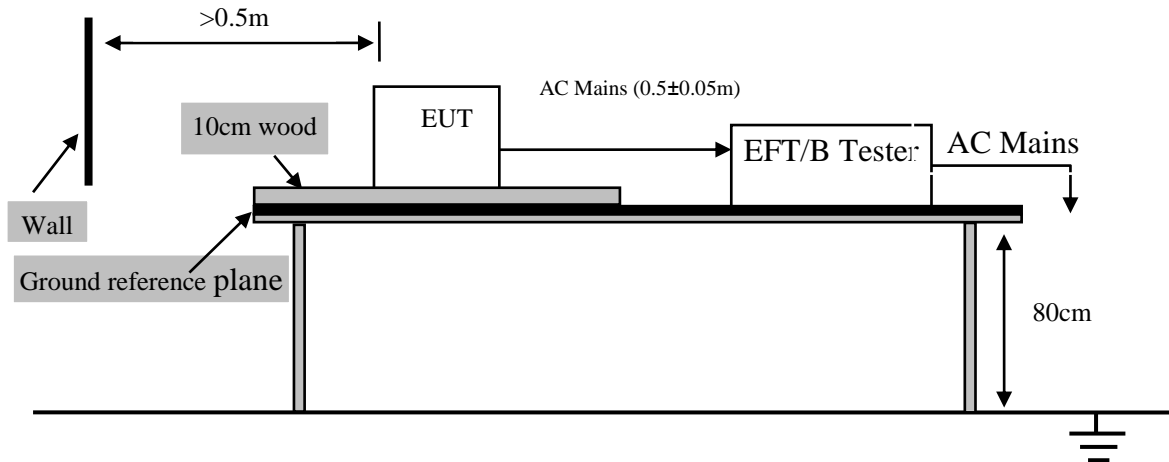
Condition of Test	Require of Test
Test Fielded Strength	3 V/m
Radiated Signal	80% amplitude modulated with a 1kHz sine wave
Scanning Frequency	80 - 1000 MHz
Sweeping time of radiated	0.0015 decade/s
Dwell Time	1 Sec.

11.7.RF Field Strength Susceptibility Test Results

EUT	: pet feeder	Test Date	: 2022.4.19		
M/N	: PAF-A06	Temperature	: 24°C		
Test Engineer	: Ben Sun	Humidity	: 56%		
Test Voltage	: AC 230V/50Hz	Pressure	: 101.6kPa		
Test Mode	: Working				
Test Results	: PASS				
Field Strength	: 3V/m				
Modulation:	<input checked="" type="checkbox"/> AM	<input type="checkbox"/> Pulse	<input type="checkbox"/> none 1 kHz 80%		
	Frequency Range :80 MHz -1000MHz				
Steps	1%				
	Horizontal		Vertical	Result	
	Required	Observation	Required	Observation	(Pass / Fail)
Front	A	A	A	A	Pass
Right	A	A	A	A	Pass
Rear	A	A	A	A	Pass
Left	A	A	A	A	Pass
Remark: Class A is no function loss					

12. Electrical Fast Transient/Burst Immunity Test

12.1. Block Diagram Of Test Setup



12.2. Test Standard

IEC 61000-4-4: 2012 (Severity Level 2 at 1kV)

12.3. Electrical Fast Transient/Burst Test Limits

Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1.	0.5 kV	0.25 kV
2.	1 kV	0.5 kV
3.	2 kV	1 kV
4.	4 kV	2 kV
X	Special	Special

- Notes:
1. Test set-up reference IEC 61000-4-4:2012
 2. Performance criterion : **B**

12.4. Configuration Of EUT On Test

The following equipment are installed on Electrostatic Discharge Test to meet the IEC 61000-4-4 requirements and operating regulations in a manner that tends to maximize its emission characteristics in normal application.

12.5. Operating Condition Of EUT

- (1) Setup the EUT as shown as Section 12.2.
- (2) Turn on the power of all equipment.
- (3) Let the EUT work in test mode and 15 minutes before taking the test.

12.6. Test Procedure

- The EUT and its simulators were placed on the ground reference plane and were insulated from it by a wood support 0.1m + 0.01m thick. The ground reference plane was 1m*1m metallic sheet with 0.65mm minimum thickness. This reference ground plane was project
- (1) beyond the EUT by at least 0.1m on all sides and the minimum distance between EUT and all other conductive structure, except the ground plane was more than 0.5m. All cables to the EUT was placed on the wood support, cables not subject to EFT/B was routed as far as possible from the cable under test to minimize the coupling between the cables.

12.7.1. For input and AC power ports:

The EUT was connected to the power mains by using a coupling device that couples the EFT interference signal to AC power lines. Both positive transients and negative transients of test voltage were applied during compliance test and the duration of the test can't less than 1min.

12.7.2. For signal lines and control lines ports:

No I/O ports. It's unnecessary to test.

12.7.3. For DC input and DC output power ports:

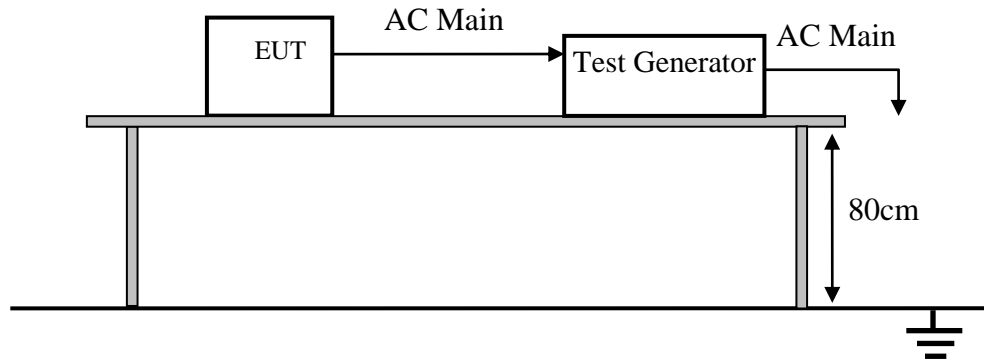
It's unnecessary to test.

12.7. Electrical Fast Transient/Burst immunity Test Results

EUT	: pet feeder	Test Date	: 2022.4.19		
M/N	: PAF-A06	Temperature	: 24°C		
Test Engineer	: Ben Sun	Humidity	: 56%		
Test Voltage	: AC 230V/50Hz	Pressure	: 101.6kPa		
Test Mode	: Working				
Test Results	: PASS				
Repetition Frequency : <u>5 kHz</u>		Burst Duration : <u>15ms</u> Burst Period: <u>300ms</u>			
Inject Time(s): <u>240s</u> Inject Method: <u>Direct</u>					
Inject Line: <input checked="" type="checkbox"/> AC Mains <input type="checkbox"/> DC Supply <input type="checkbox"/> Signal					
Line	Test Voltage	Performance			Result (Pass/Fail)
		Required	Observation(+)	Observation(-)	
L	1kV	B	A	A	Pass
N	1kV	B	A	A	Pass
L N	1kV	B	A	A	Pass
L-PE	/	/	/	/	/
N-PE	/	/	/	/	/
L-N-PE	/	/	/	/	/
Signal Line	/	/	/	/	/
Note: 1. Class A is no function loss.					

13. Surge Test

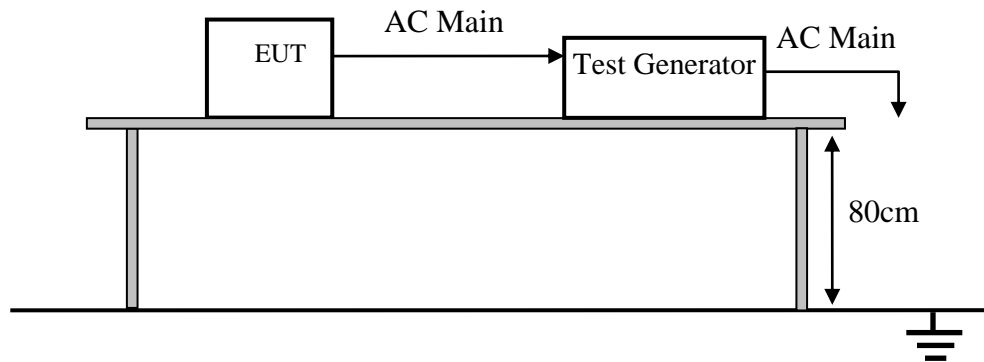
13.1. Block Diagram Of Test Setup



13.2. Test Standard

IEC 61000-4-5: 2014+A1:2017

13.3. Surge Test Limits



Environmental phenomenon	Test specifications	Test set-up
Surge	1,2/50 (8/20) μ s Tr/Td 2 kV line-to-earth with 12 Ω Impedance 1 kV line-to-line with 2 Ω Impedance	IEC 61000-4-5

Severity level

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

Performance criterion : B**13.4.Configuration Of EUT On Test**

The following equipment are installed on Electrostatic Discharge Test to meet the IEC 61000-4-5: 2014+A1: 2017 requirements and operating regulations in a manner that tends to maximize its emission characteristics in normal application.

13.5.Operating Condition Of EUT

- (1) Setup the EUT as shown as Section 13.2.
- (2) Turn on the power of all equipment.
- (3) Let the EUT work in test mode and 15 minutes before taking the test.

13.6.Test Procedure

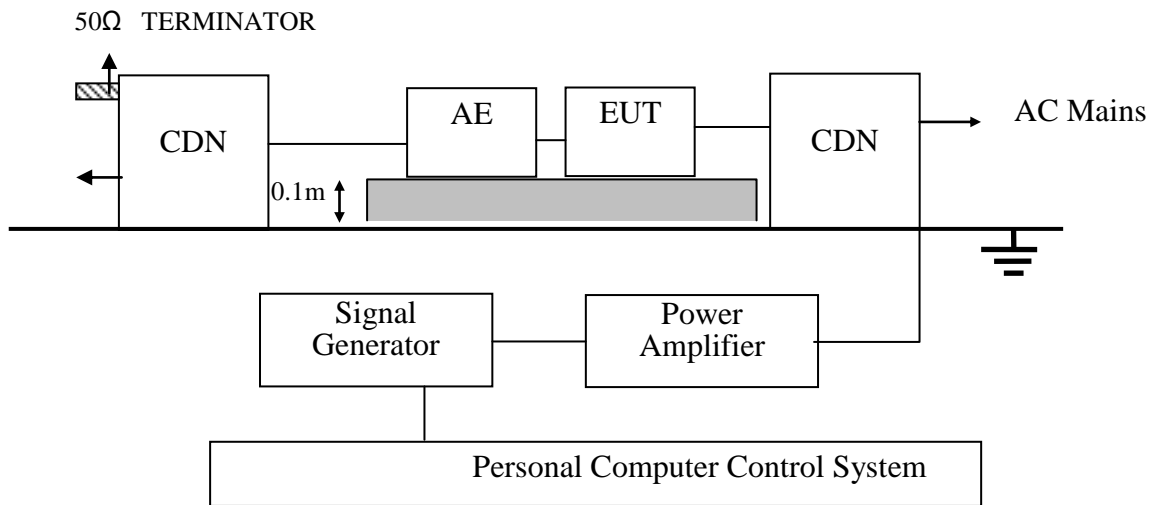
- (1) For line to line coupling mode, provide a 1.0kV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.
- (2) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- (3) Different phase angles are done individually.
- (4) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

13.7.Surge Test Results

EUT : pet feeder						Test Date : 2022.4.19					
M/N : PAF-A06						Temperature : 24°C					
Test Engineer : Ben Sun						Humidity : 56%					
Test Voltage : AC 230V/50Hz						Pressure : 101.6kPa					
Test Mode : Working											
Test Results : PASS											
No.of pluse: 5 Times/Phase Angle						Interval:60 Seconds					
Line : <input checked="" type="checkbox"/> AC Mains <input type="checkbox"/> DC Supply <input type="checkbox"/> Signal											
Location	Volt	500V			1kV			2kV			Result
	Phase	Performance			Performance			Performance			(Pass/ Fail)
		Required	+	-	Required	+	-	Required	+	-	
L-N	0°	/	/	/	/	/	/	/	/	/	/
	90°	/	/	/	B	A	/	/	/	/	Pass
	180°	/	/	/	/	/	/	/	/	/	/
	270°	/	/	/	B	/	A	/	/	/	Pass
L-PE	0°	/	/	/	/	/	/	/	/	/	/
	90°	/	/	/	/	/	/	/	/	/	/
	180°	/	/	/	/	/	/	/	/	/	/
	270°	/	/	/	/	/	/	/	/	/	/
N-PE	0°	/	/	/	/	/	/	/	/	/	/
	90°	/	/	/	/	/	/	/	/	/	/
	180°	/	/	/	/	/	/	/	/	/	/
	270°	/	/	/	/	/	/	/	/	/	/
Signal Line	/	/	/	/	/	/	/	/	/	/	/
Note: 1. Class A is no function loss.											

14. Injected Currents Susceptibility Test

14.1. Block Diagram Of Test Setup



14.2. Test Standard

IEC 61000-4-6: 2013

(Severity Level 2 at 3Vrms and frequency is from 0.15MHz to 230MHz)

14.3. Injected Currents Susceptibility Test Limits

Level	Voltage Level (e.m.f.) V
1	1
2	3
3	10
X	Special

- Notes:
1. Test set-up reference IEC 61000-4-6:2013
 2. Performance criterion: A

14.4. Configuration Of EUT On Test

The following equipment are installed on Electrostatic Discharge Test to meet the IEC 61000-4-6 requirements and operating regulations in a manner that tends to maximize its emission characteristics in normal application.

14.5. Operating Condition Of EUT

- (1) Setup the EUT as shown as Section 14.2.
- (2) Turn on the power of all equipment.
- (3) Let the EUT work in test mode and 15 minutes before taking the test.

14.6. Test Procedure

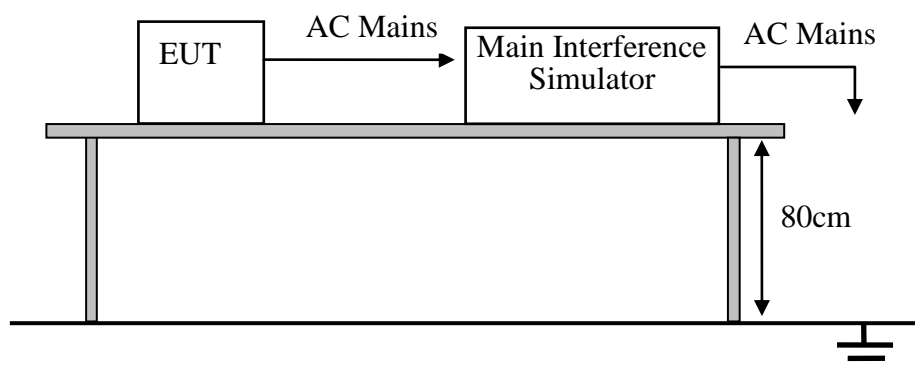
- (1) Let the EUT work in test mode and test it.
The EUT are placed on an insulating support 0.1m high above a ground reference plane.
- (2) CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- (3) The disturbance signal described below is injected to EUT through CDN.
- (4) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- (5) The frequency range is swept from 0.150MHz to 230MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.
The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept
- (6) incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- (7) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

14.7.Injected Currents Susceptibility Test Results

EUT : pet feeder			Test Date : 2022.4.19		
M/N : PAF-A06			Temperature : 24°C		
Test Engineer : Ben Sun			Humidity : 56%		
Test Voltage : AC 230V/50Hz			Pressure : 101.6kPa		
Test Mode : Working					
Test Results : PASS					
Frequency Range (MHz)	Injected Position	Voltage Level (e.m.f.)	Required	Observation	Result
					(Pass / Fail)
0.15 ~ 80	AC Line	3V/m	A	A	PASS
Step : <u> 1 </u> % Dwell Time : <u> 1 </u> Sec					
DIRECT CDN Type : <input checked="" type="checkbox"/> M2 <input type="checkbox"/> M3 <input type="checkbox"/> Clamp					
Modulation Signal:1kHz 80% AM					
Remark: Class A is no function loss.					

15. Voltage Dips and Interruptions Test

15.1. Block Diagram Of Test Setup



15.2. Test Standard

IEC 61000-4-11: 2020

15.3. Voltage Dips and Interruptions Test Limits

Test Level %U _T	Voltage dip and short interruptions %U _T	Performance Criterion	Duration (in period)
0	100	C	0.5P
40	60	C	10P
70	30	C	25P

Notes: Test set-up reference IEC 61000-4-11:2004

15.4. Configuration Of EUT On Test

The following equipment are installed on Electrostatic Discharge Test to meet the IEC 61000-4-11 requirements and operating regulations in a manner that tends to maximize its emission characteristics in normal application.

15.5. Operating Condition Of EUT

- (1) Setup the EUT as shown as Section 15.2.
- (2) Turn on the power of all equipment.
- (3) Let the EUT work in test mode and 15 minutes before taking the test.

15.6. Test Procedure

- (1) The interruption is introduced at selected phase angles with specified duration.
- (2) Record any degradation of performance.

15.7.Voltage Dips And Interruptions Test Results

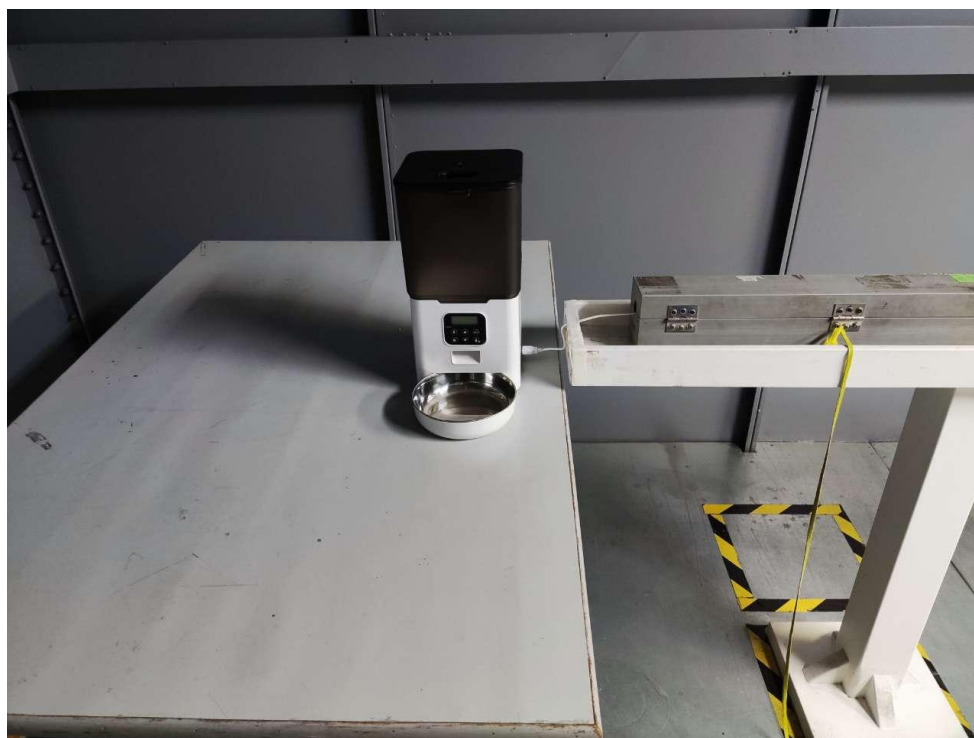
EUT : pet feeder				Test Date : 2022.4.19		
M/N : PAF-A06				Temperature : 24°C		
Test Engineer : Ben Sun				Humidity : 56%		
Test Voltage : AC 230V/50Hz				Pressure : 101.6kPa		
Test Mode : Working						
Test Results : PASS						
Test Level % U_T	Voltage Dips & Short Interruptions % U_T	Duration (in period)	Phase Angle	Required	Observation	Result
						(Pass / Fail)
0	100	0.5P	0° -360°	C	A	PASS
40	60	10P	0° -360°	C	B	PASS
70	30	25P	0° -360°	C	B	PASS
<p>Note: 1. U_T is the rated voltage for the equipment.</p> <p>2. Class A is no faction loss.</p> <p>2. Class B is EUT slight change in the test, but it can automatically reply.</p>						

16. Photograph

16.1. Photos Of Power Line Conducted Emission Test



16.2. Disturbance Power Test



16.3.Photos Of RF Field Strength Susceptibility Test



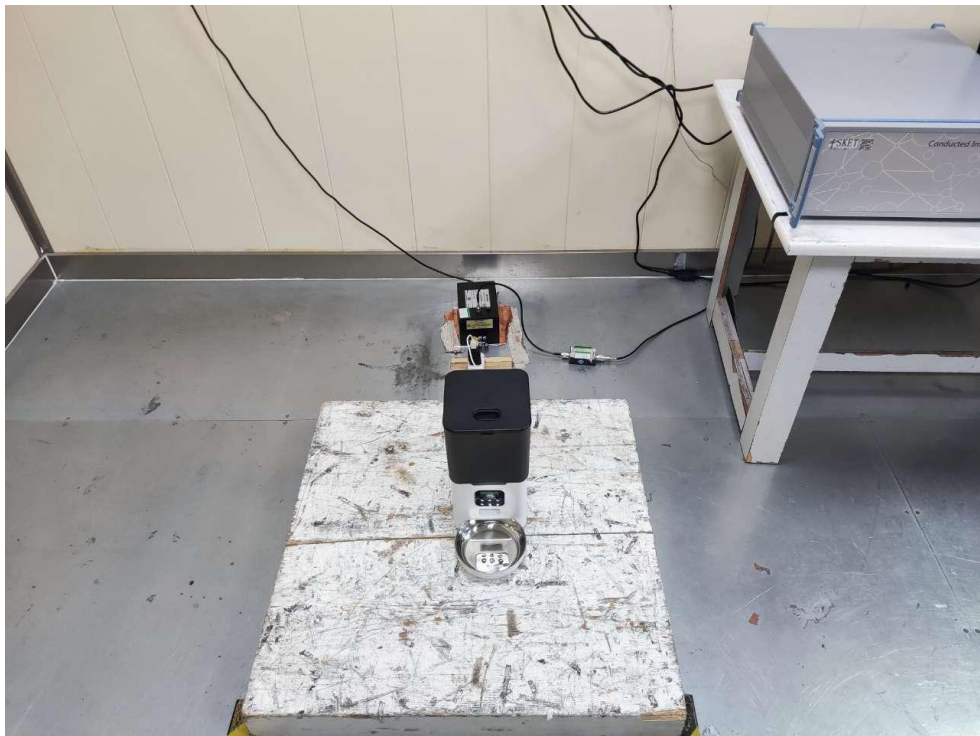
16.4.Photos Of Harmonic & Flicker Test



16.5.Photos Of Electrostatic Discharge Test



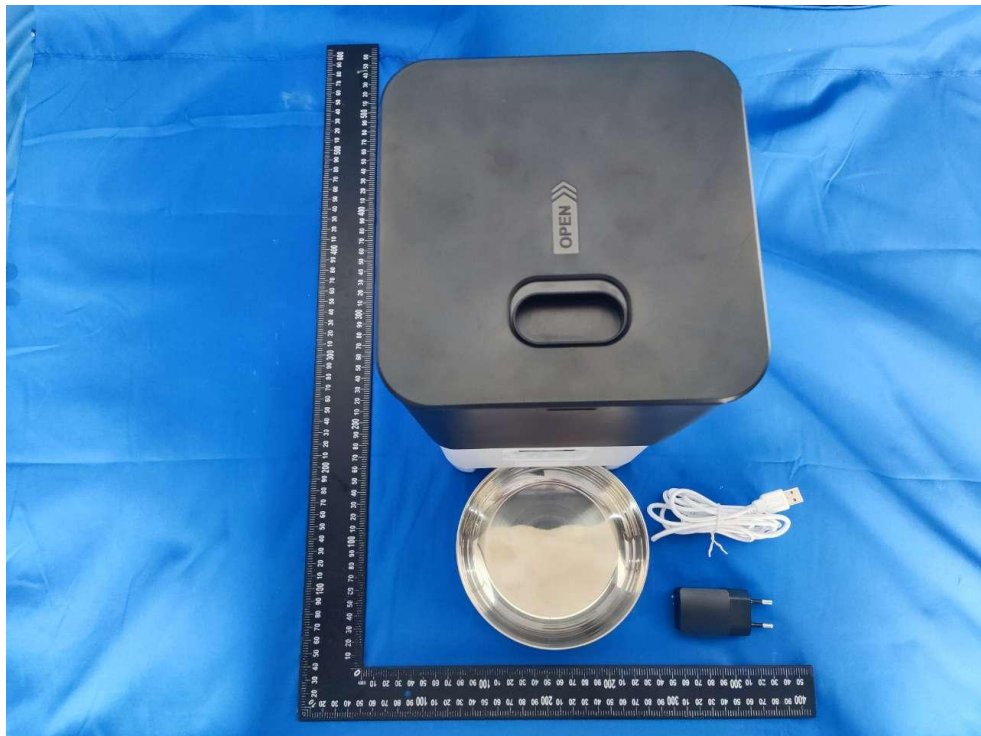
16.6.Photos Of Injected Currents Susceptibility Test



16.7.Photos Of Electrical EFT & Surge & Dips Test



17.Photos Of The EUT



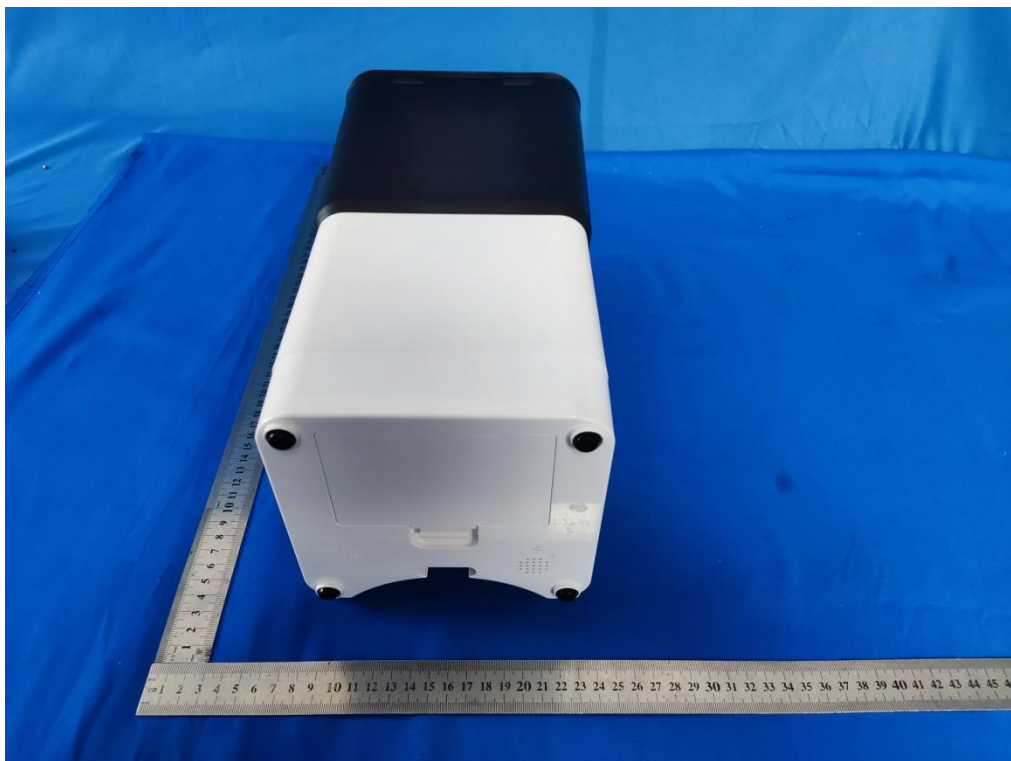
EUT View



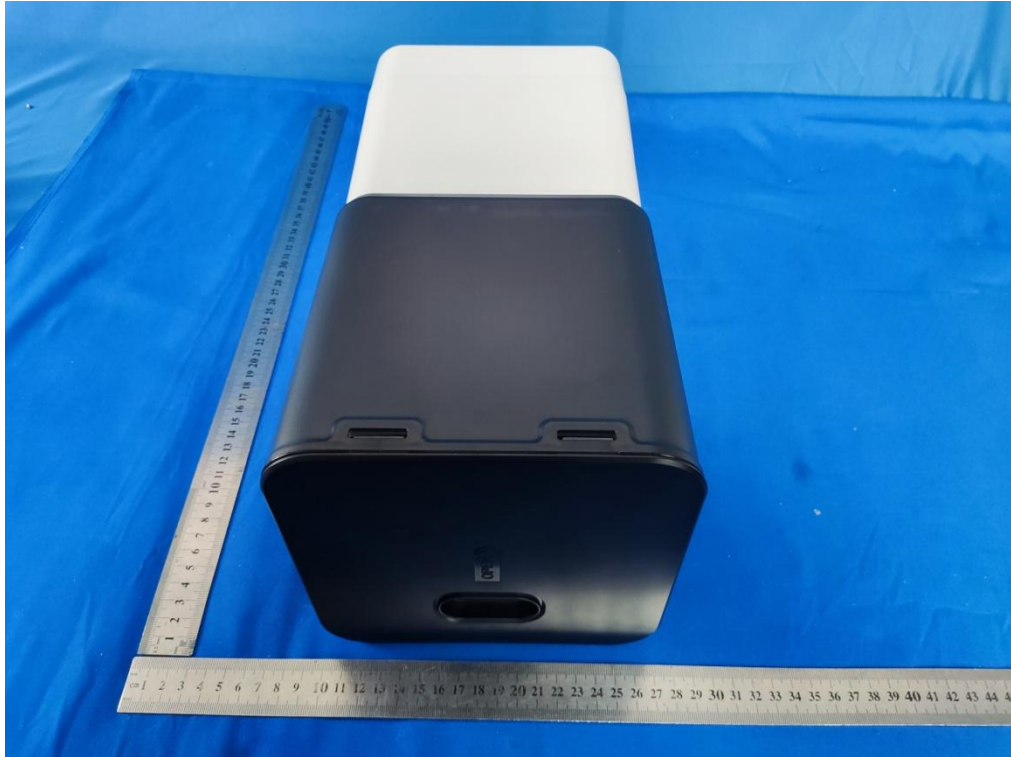
EUT View



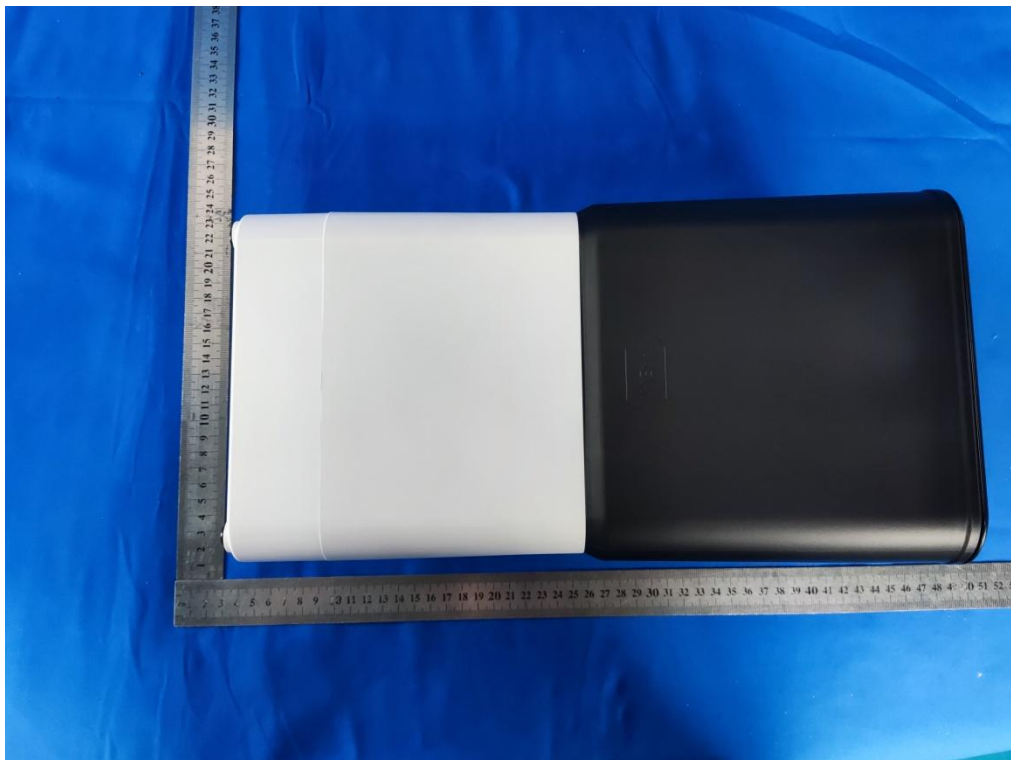
EUT View



EUT View



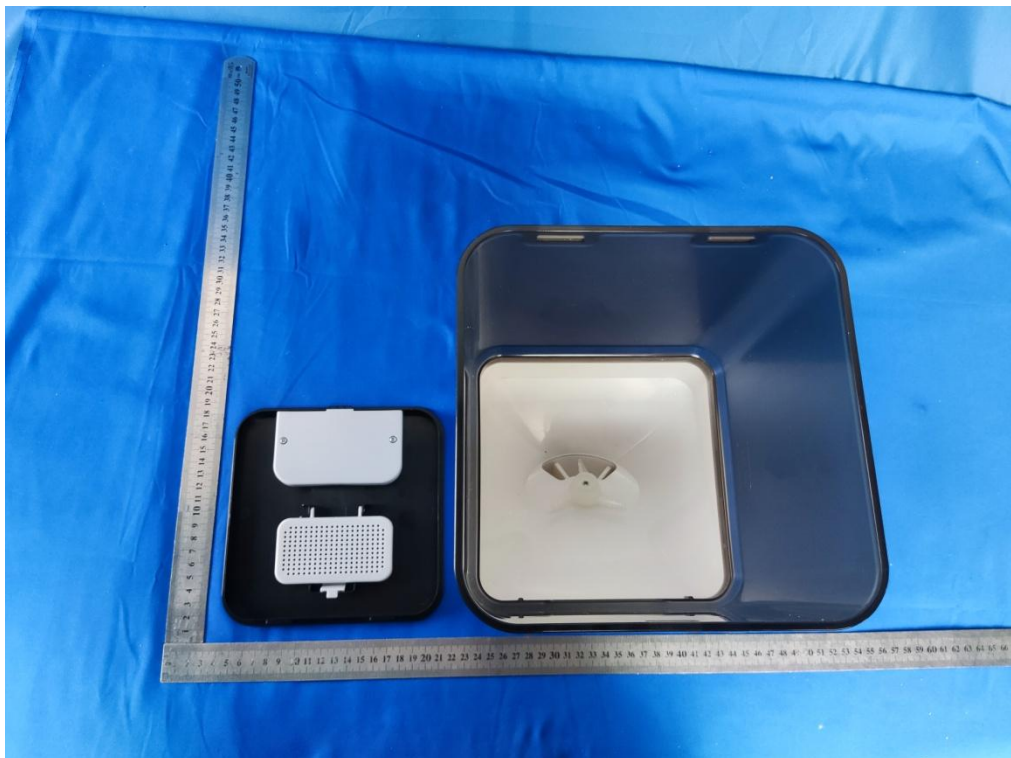
EUT View



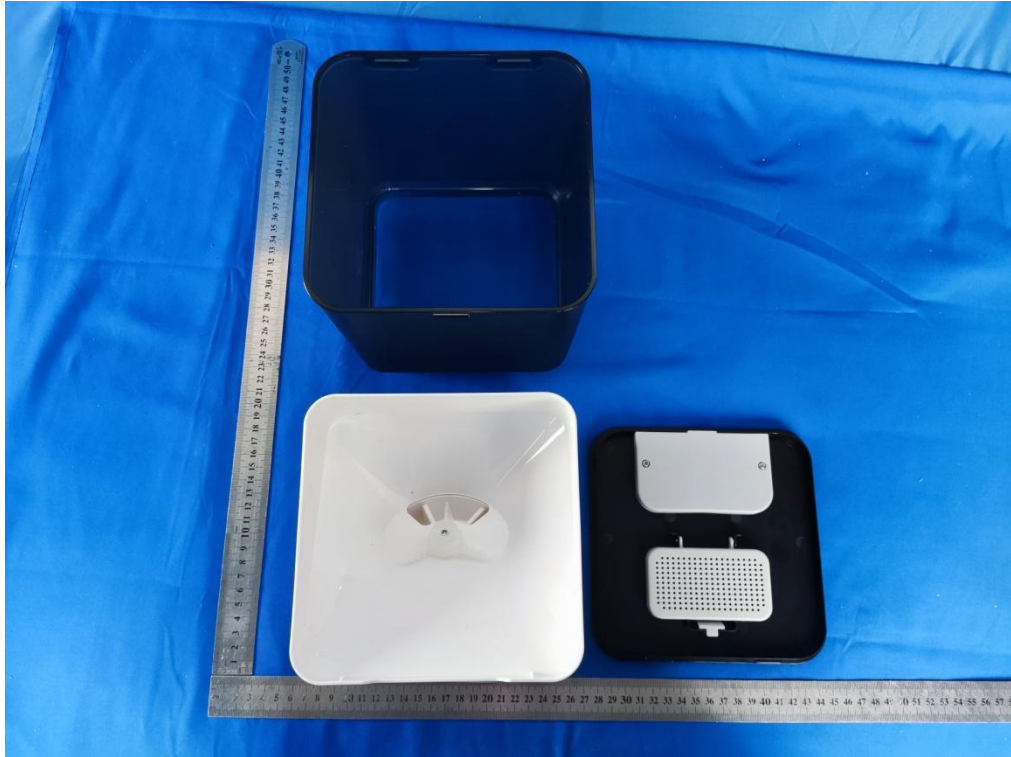
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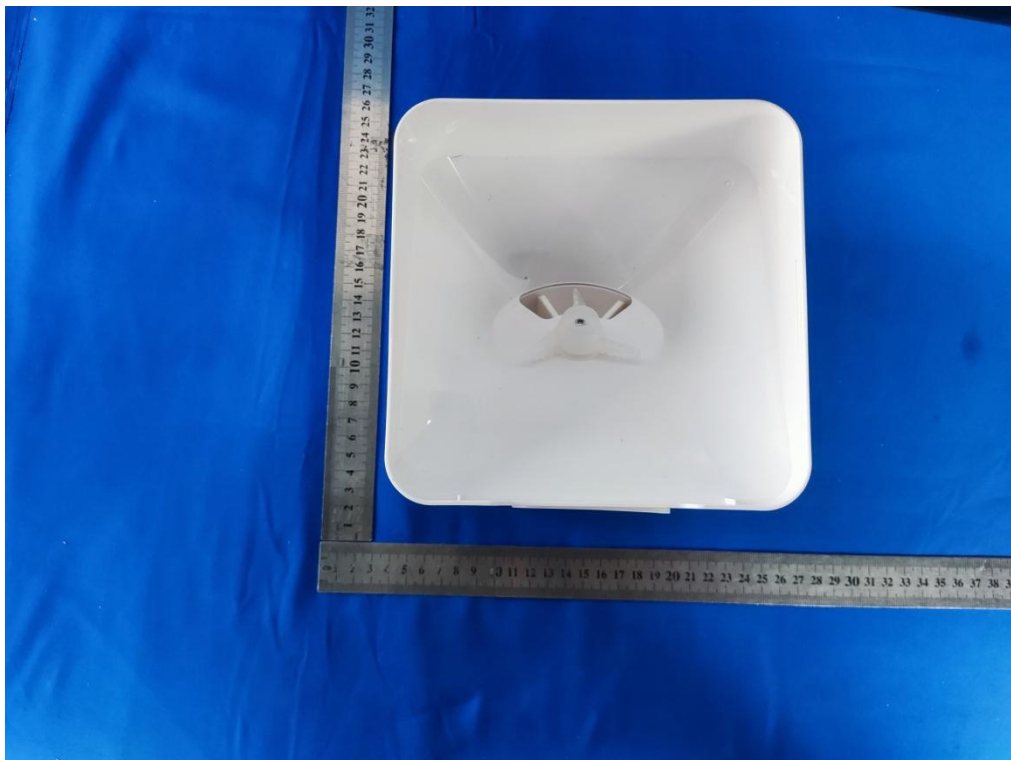
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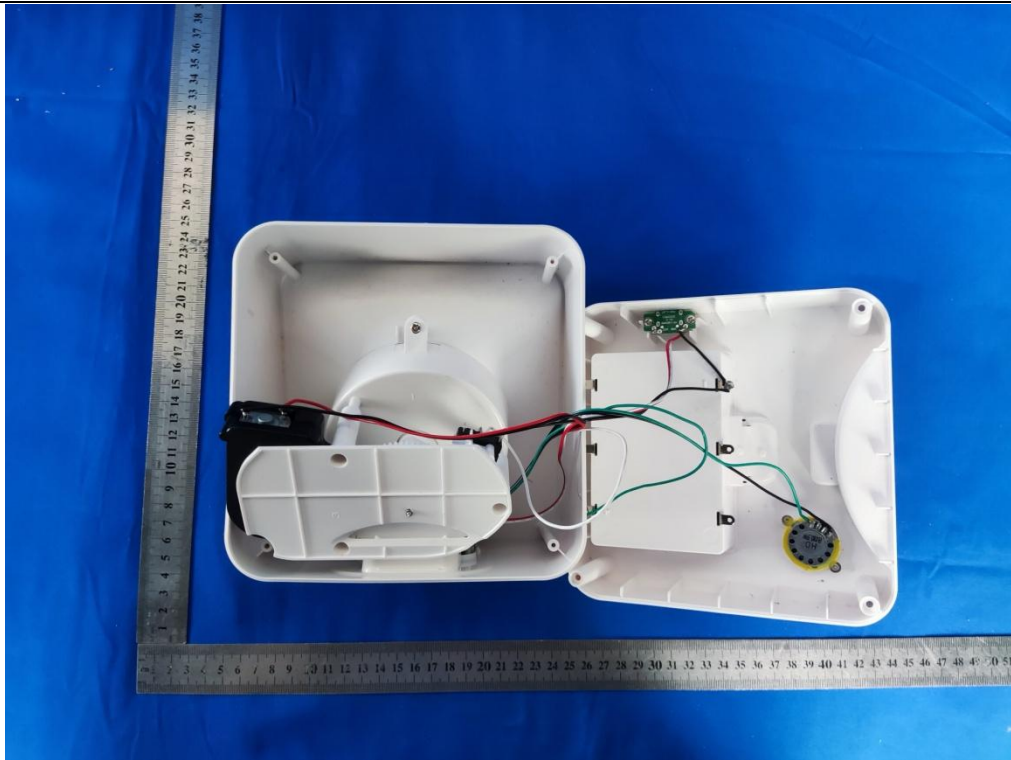
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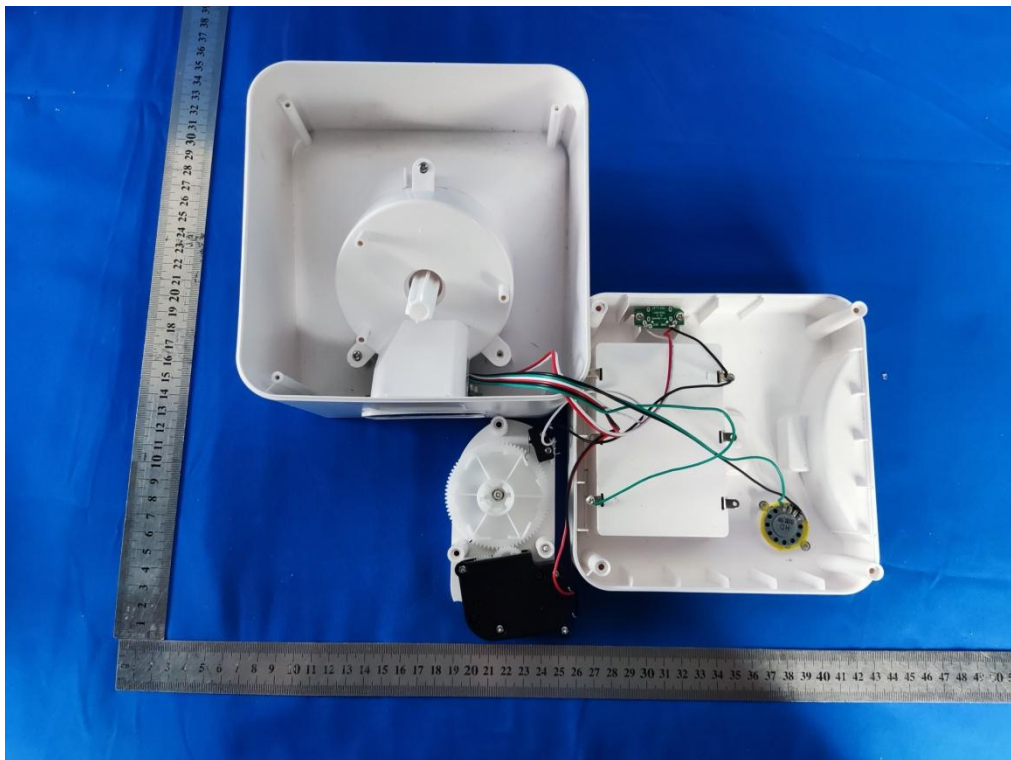
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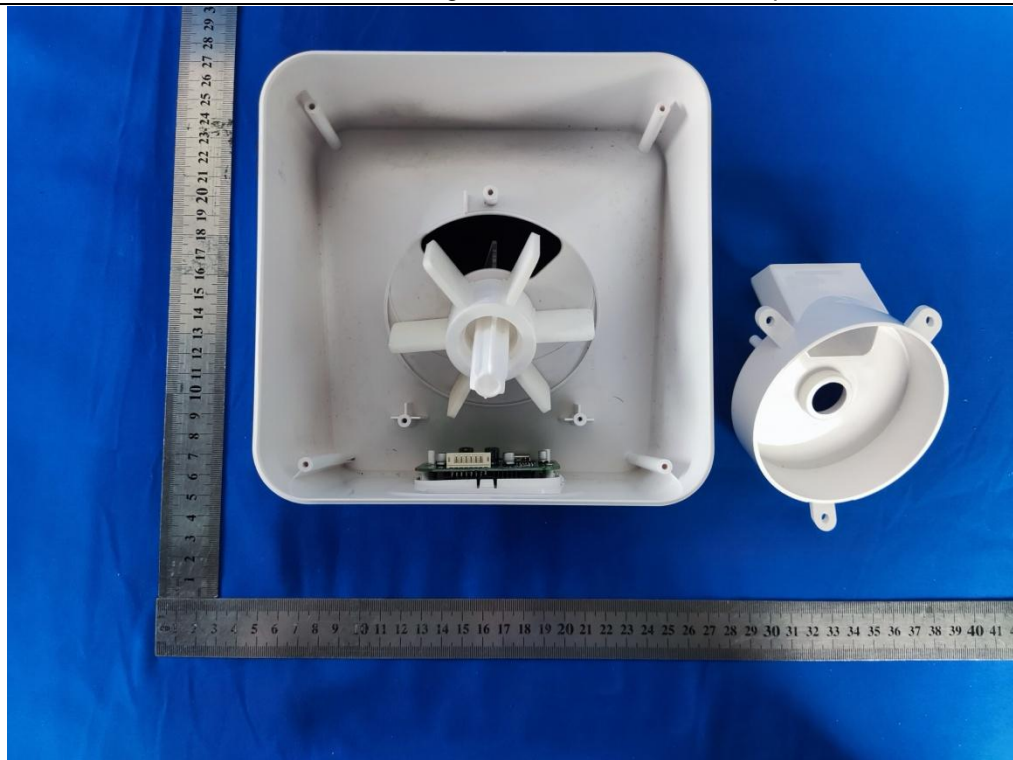
EUT View



EUT View



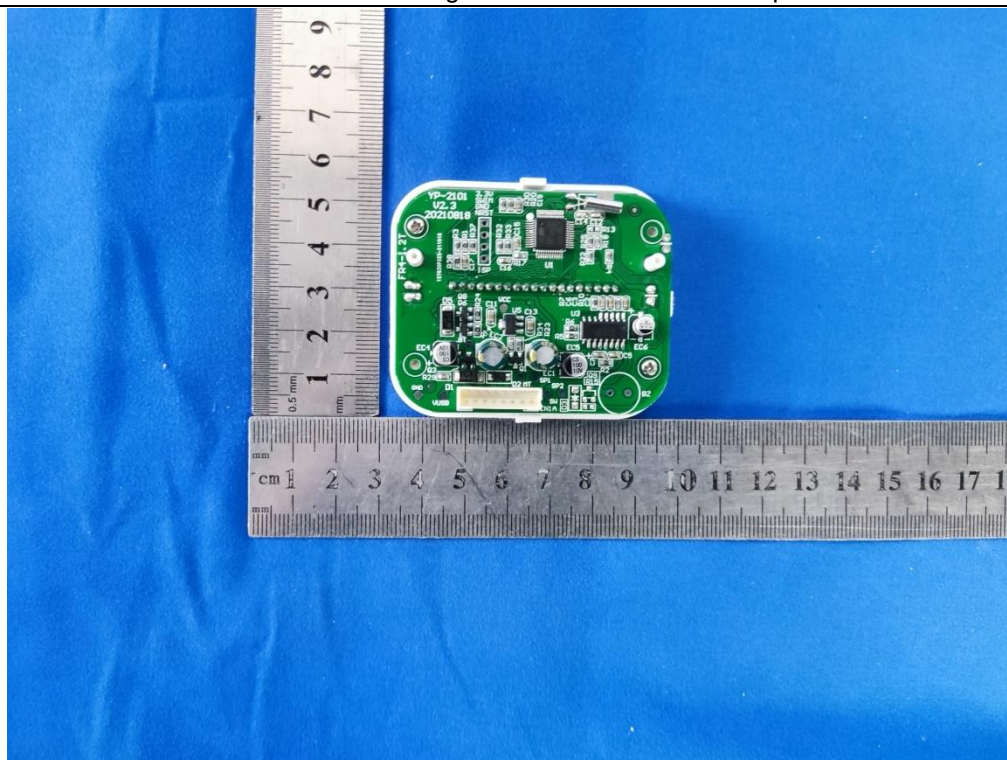
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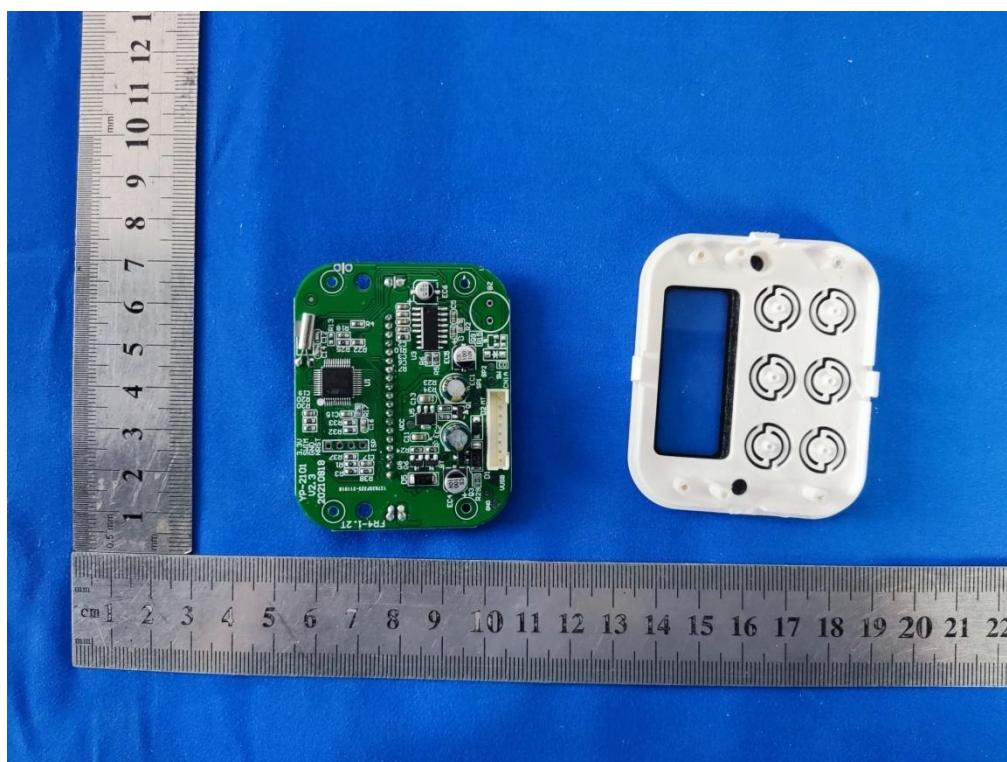
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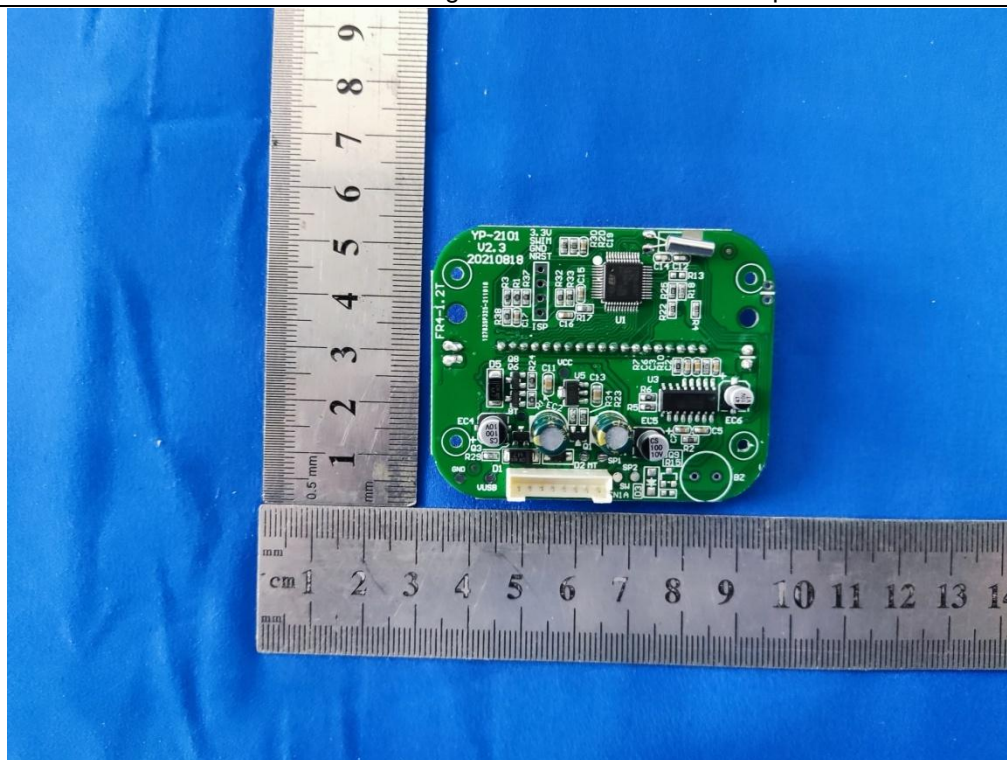
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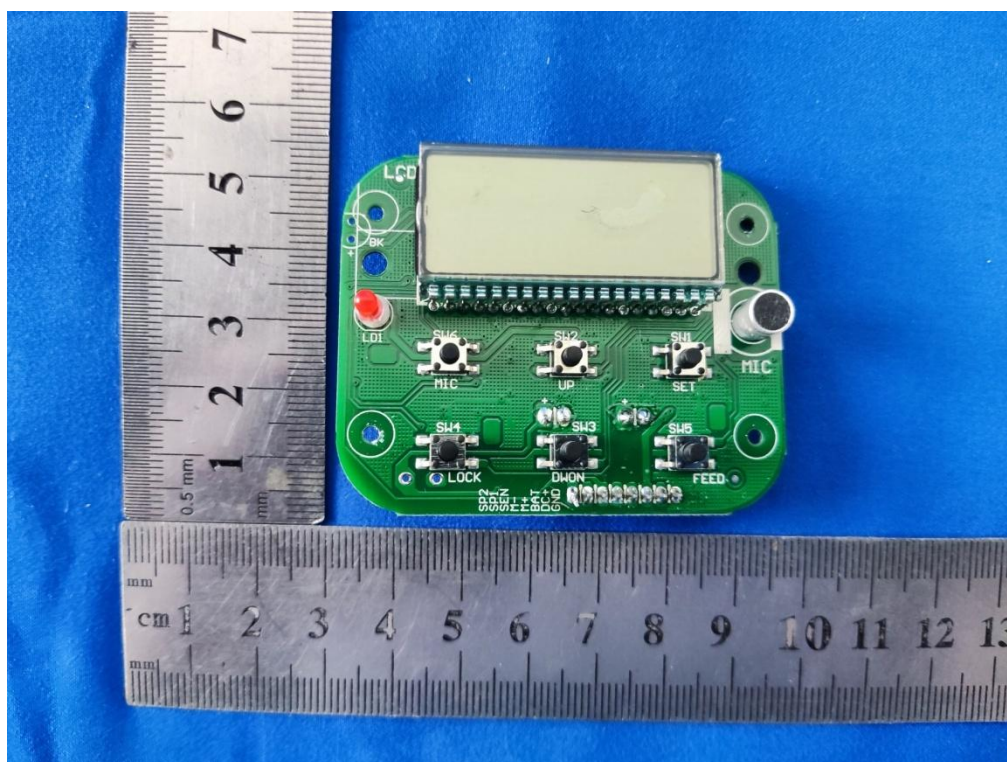
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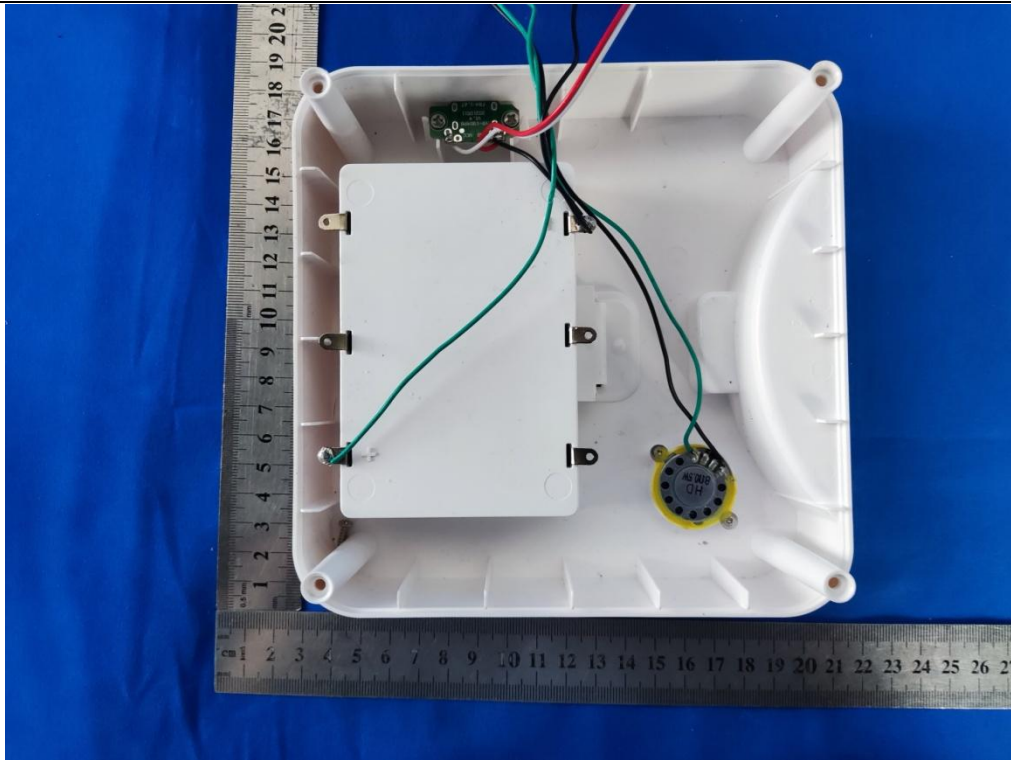
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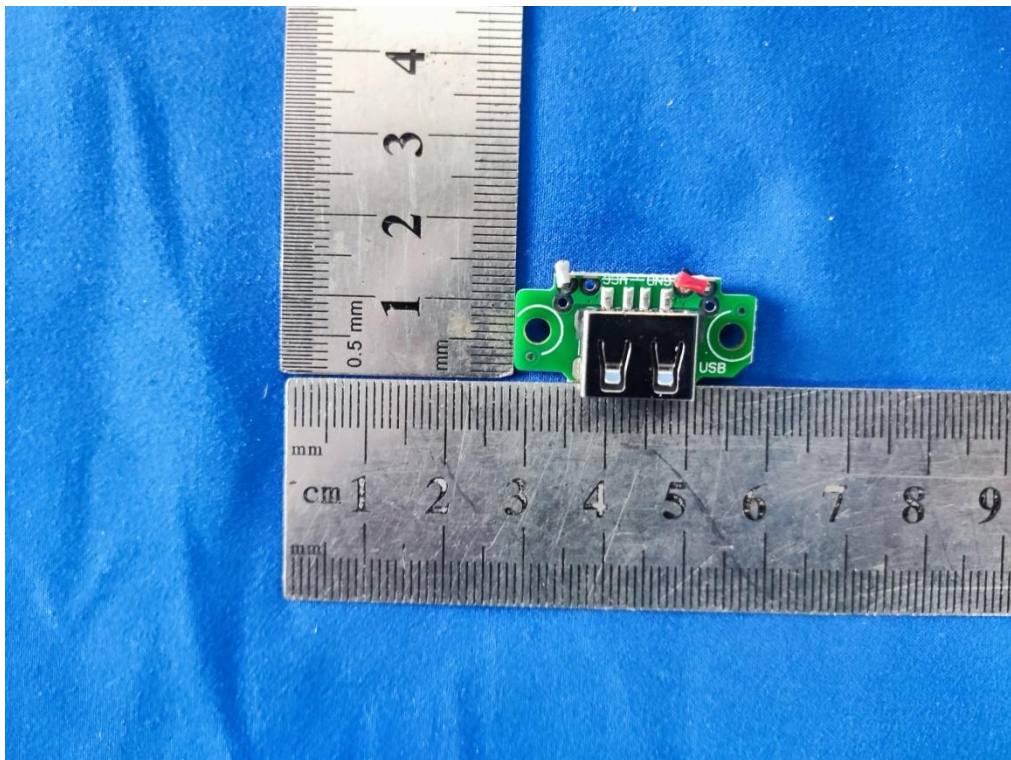
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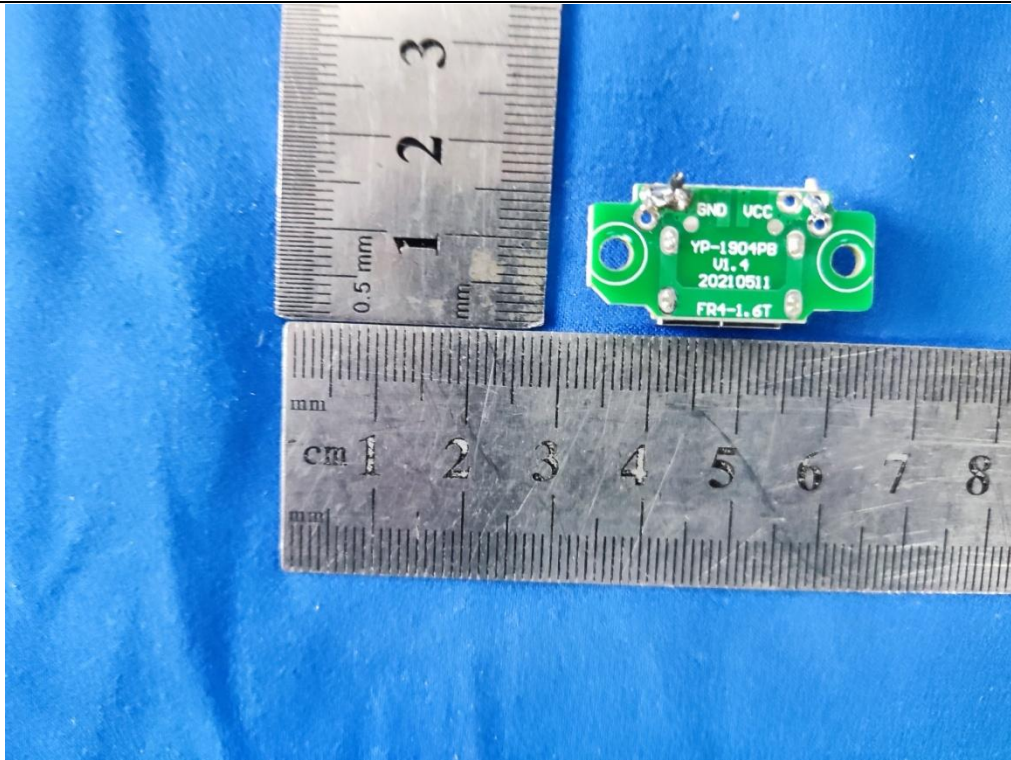
EUT View



EUT View



EUT View



EUT View



EUT View

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