

EMC Test Report

Client Name : Genhigh Tech Co., Limited

Address : Room 201, Building A, No. 1, Qianwan 1st Road, Qianhai
Shenzhen-Hong Kong Cooperation Zone, Shenzhen

Product Name : Neakasa PowerSrub II

Date : May 23, 2022



Shenzhen Anbotek Compliance Laboratory Limited



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TEST REPORT

Applicant : Genhigh Tech Co., Limited

Manufacturer : Genhigh Tech Co., Limited

Product Name : Neakasa PowerSrub II

Model No. : HN0080W, HN0080X (X represents the appearance of different colors)

Trade Mark : N.A.

Rating(s) : For Adaptor Input: AC 100-240V, 50/60Hz, 0.8A
For Adaptor Output: 35V DC 0.5A (Battery 28.8V, 3000mAh)

Test Standard(s) : **EN 55014-1: 2017+A11:2020;**
EN IEC 61000-3-2: 2019;
EN 61000-3-3: 2013+A1:2019;
EN 55014-2: 2015
(IEC 61000-4-2; IEC 61000-4-3; IEC 61000-4-4;
IEC 61000-4-5; IEC 61000-4-6; IEC 61000-4-11)

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited To determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. This report shows the EUT to be technically compliant with the EN 55014-1, EN IEC 61000-3-2, EN 61000-3-3 and EN 55014-2 requirements. The test results are contained in this report and Shenzhen Anbotek Compliance Laboratory Limited Is assumed full responsibility for the accuracy and completeness of these tests.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited

Date of Receipt: Jan. 24, 2022

Date of Test: Jan. 24~May 19, 2022

Prepared By:



(We Zeng)

Approved & Authorized Signer:



(KingKong Jin)



1. General Information

1.1. Client Information

Applicant	:	Genhigh Tech Co., Limited
Address	:	Room 201, Building A, No. 1, Qianwan 1st Road, Qianhai Shenzhen-Hong Kong Cooperation Zone, Shenzhen
Manufacturer	:	Genhigh Tech Co., Limited
Address	:	Room 201, Building A, No. 1, Qianwan 1st Road, Qianhai Shenzhen-Hong Kong Cooperation Zone, Shenzhen
Factory	:	Genhigh Tech Co., Limited
Address	:	Room 201, Building A, No. 1, Qianwan 1st Road, Qianhai Shenzhen-Hong Kong Cooperation Zone, Shenzhen

1.2. Description of Device (EUT)

Product Name	:	Neakasa PowerSub II	
Model No.	:	HN0080W, HN0080X (X represents the appearance of different colors) (Note: All samples are the same except the model number & appearance, so we prepare "HN0080W" for EMC test only.)	
Trade Mark	:	N.A.	
Test Power Supply	:	AC 230V, 50Hz / DC 28.8V	
Test Sample No.	:	1-1-1	
Product Description	:	Adapter:	Model: A241-35005001 Input: 100-240V~, 50/60Hz, 0.8A Output: 35.0V---0.5A, 17.5W
Remark: (1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.			

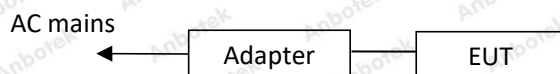
1.3. Auxiliary Equipment Used During Test

N/A	
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1.4. Description of Test Mode

Pretest Mode	Description
Mode 1	Charging
Mode 2	On

For Mode 1 Block Diagram of Test Setup



For Mode 2 Block Diagram of Test Setup



1.5. Test Summary

Test Items	Test Mode	Status
Power Line Conducted Emission Test (150kHz To 30MHz)	Mode 1	P
Disturbance Power Test (30MHz To 300MHz)	Mode 1	P
Radiated Emission Test (30MHz To 1000MHz)	/	N
Harmonic Current Test	/	N
Voltage Fluctuations and Flicker Test	Mode 1	P
Electrostatic Discharge immunity Test	All Mode	P
RF Field Strength susceptibility Test	All Mode	P
Electrical Fast Transient/Burst Immunity Test	Mode 1	P
Surge Immunity Test	Mode 1	P
Injected Currents Susceptibility Test	Mode 1	P
Voltage Dips and Interruptions Test	Mode 1	P
P) Indicates "PASS".		
N) Indicates "Not applicable".		

1.6. Test Equipment List

Conducted Emission Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	Oct. 22, 2021	1 Year
2.	Three Phase V-type Artificial Power Network	CYBERTEK	EM5040DT	E215040D T001	Jul. 05, 2021	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 22, 2021	1 Year
4.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Oct. 22, 2021	1 Year
5.	Software Name EZ-EMC	Ferrari Technology	ANB-03A	N/A	N/A	N/A

Power Clamp Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Absorbing Clamp	FCC	F-201-23MM	08166	Oct. 22, 2021	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 22, 2021	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Oct. 22, 2021	1 Year
4.	Software Name EZ-EMC	Ferrari Technology	ANB-03A	N/A	N/A	N/A

Harmonic and Flicker Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Programmable AC Power source	IVYTECH	APS-5005A	632734	Oct. 22, 2021	1 Year
2.	Harmonic and Flicker Analyzer	EMC-PARTNER	HMONICS 1000-1P	164	Oct. 22, 2021	1 Year
3.	Harmonics-1000	N/A	Ed.3.0+4.0	N.A	N/A	N/A

Electrostatic Discharge Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	ESD Simulators	emtest	ESD NX30.1	11936	Mar. 25, 2022	1 Year

R/S Immunity Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Signal Generator	Agilent	N5182A	MY4818065 6	Oct. 22, 2021	1 Year
2.	Amplifier	Micotoop	MPA-80-100 0-250	MPA190309 6	Oct. 22, 2021	1 Year
3.	Amplifier	Micotoop	MPA-1000-6 000-100	MPA190312 2	Oct. 22, 2021	1 Year
4.	Log-Periodic Antenna	Schwarzbeck	VULP9118E	00992	N/A	N/A
5.	Horn Antenna	Instruments corporation	GTH-0118	351600	Oct. 22, 2021	2 Year
6.	Power Sensor	Agilent	E9301A	MY4149890 6	Oct. 22, 2021	1 Year
7.	Power Sensor	Agilent	E9301A	MY4149808 8	Oct. 22, 2021	1 Year
8.	Power Meter	Agilent	E4419B	GB4020290 9	Oct. 22, 2021	1 Year
9.	Electric field Probe	Narda	EP 601	811ZX10351	Oct. 22, 2021	1 Year
10.	RS Test software	EMtrace	EM 3	V1.1.7	N/A	N/A

Electrical Fast Transient/Burst Immunity Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Surge Generator	TESEQ	NSG 3060	1480	Oct. 22, 2021	1 Year
2.	CDN	TESEQ	CDN 3061	1408	Oct. 22, 2021	1 Year
3.	EFT-Clamp	PRIMA	EFT-Clamp	/	Oct. 22, 2021	1 Year

Surge Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Combined Wave Lightning Surge Simulator	3Ctest	CCS600	ES3771702	Jul. 05, 2021	1 Year
2.	Three Phase Power Coupling Network	3Ctest	SEPN69100 T	ES0801757	Jul. 05, 2021	1 Year
3.	Telecom port surge generator	PMI	TW101	190411	May 13, 2022	1 Year

Injected Currents Susceptibility Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	C/S Conducted Immunity Test System	FRANKONIA	CIT-10	126A1196/2012	Oct. 22, 2021	1 Year
2.	CDN	FRANKONIA	CDN - M2+ M3	A2210178/2012	Oct. 22, 2021	1 Year
3.	6dB Attenuator	FRANKONIA	DAM 26W	1172202	Oct. 22, 2021	1 Year
4.	CIT-10	FRANKONIA	Version1.1.7	N/A	N/A	N/A
5.	EM-Clamp	FRANKONIA	EMCL-20	18101728-0103	May 17,2022	1 Year

Voltage Dips and Interruptions Measurement

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	CYCLE SAG Simulator	PRIMA	DRP61011A G	PR12046234	Oct. 22, 2021	1 Year

1.7. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

FCC-Registration No.: 184111

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 184111.

ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.

1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518128

1.8. EMS Performance Criteria

- ✓ A: Normal performance within the specification limits
- ✓ B: Temporary degradation or loss of function or performance which is self-recoverable
- ✓ C: Temporary degradation or loss of function or performance which requires operator intervention or system reset
- ✓ D: Degradation or loss of function which is not recoverable due to damage of equipment (components) or software, or loss of data

Note: The manufacturer's specification may define effects on the EUT which may be considered insignificant, and therefore acceptable.

This classification may be used as a guide in formulating performance criteria, by committees responsible for generic, product and product-family standards, or as a framework for the agreement on performance criteria between the manufacturer and the purchaser, for example where no suitable generic, product or product-family standard exists.



2. Power Line Conducted Emission Test

2.1. Test Standard and Limit

Test Standard	EN 55014-1
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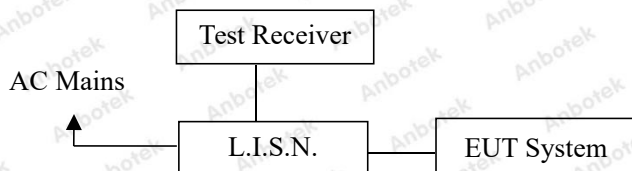
Limits for conducted emissions

Test Limit	Frequency (MHz)	At mains terminals (dB μ V)	
		Quasi-peak Level	Average Level
	0.15 ~ 0.50	66.0 ~ 56.0*	59.0 ~ 46.0*
	0.50 ~ 5.00	56.0	46.0
	5.00 ~ 30.00	60.0	50.0

Remark: (1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

2.2. Test Setup



2.3. EUT Configuration on Measurement

The following equipments are installed on Conducted Emission Measurement to meet EN 55014–1 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

2.4. Operating Condition of EUT

2.4.1. Setup the EUT as shown in Section 2.2.

2.4.2. Turn on the power of all equipments.

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

2.5. Test Procedure

The EUT is put on the plane 0.1 m high above the ground by insulating support and connected to the AC mains through Line Impedance Stability Network(L.I.S.N). This provided a 50ohm coupling impedance for the tested equipments. Both sides of AC line are investigated to find out the maximum conducted emission according to the EN 55014-1 regulations during conducted emission measurement.

The bandwidth of the field strength meter (R&S Test Receiver ESCI) is set at 9kHz in 150kHz~30MHz.

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

All the test results are listed in Section 2.6.

2.6. Test Results

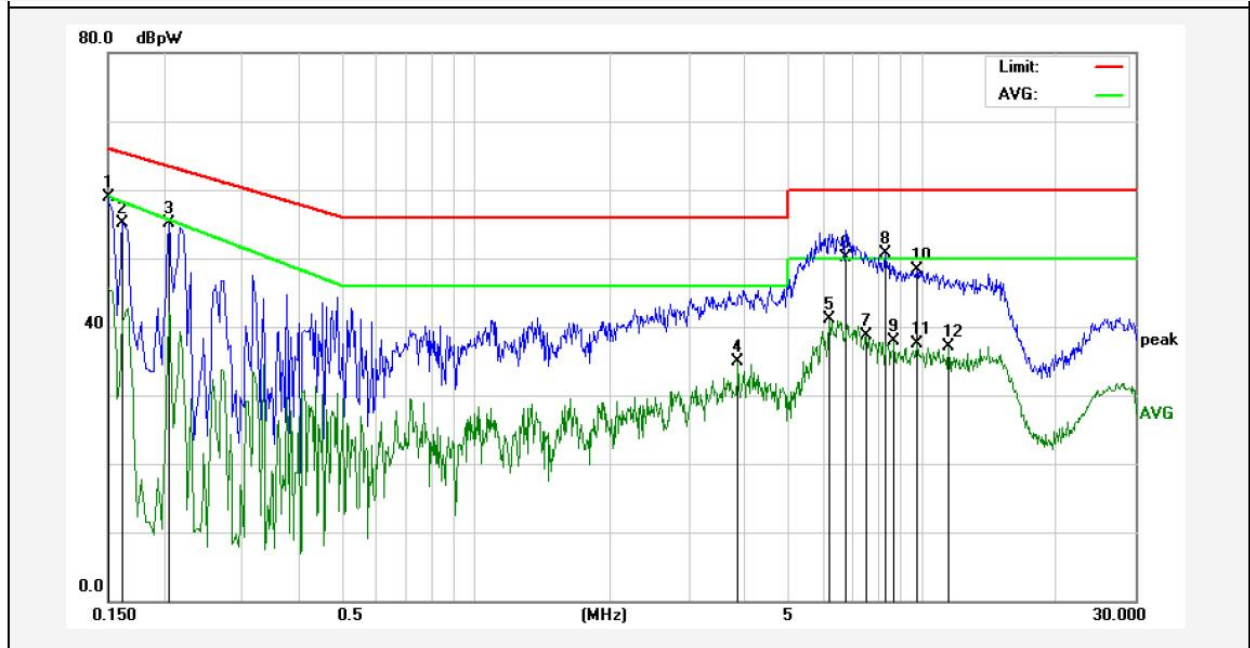
PASS

The test curves are shown in the following pages.



Conducted Emission Test Data

Test Site: 1# Shielded Room
 Test Specification: AC 230V, 50Hz
 Comment: Live Line
 Temp.: 23.5°C Hum.: 46%

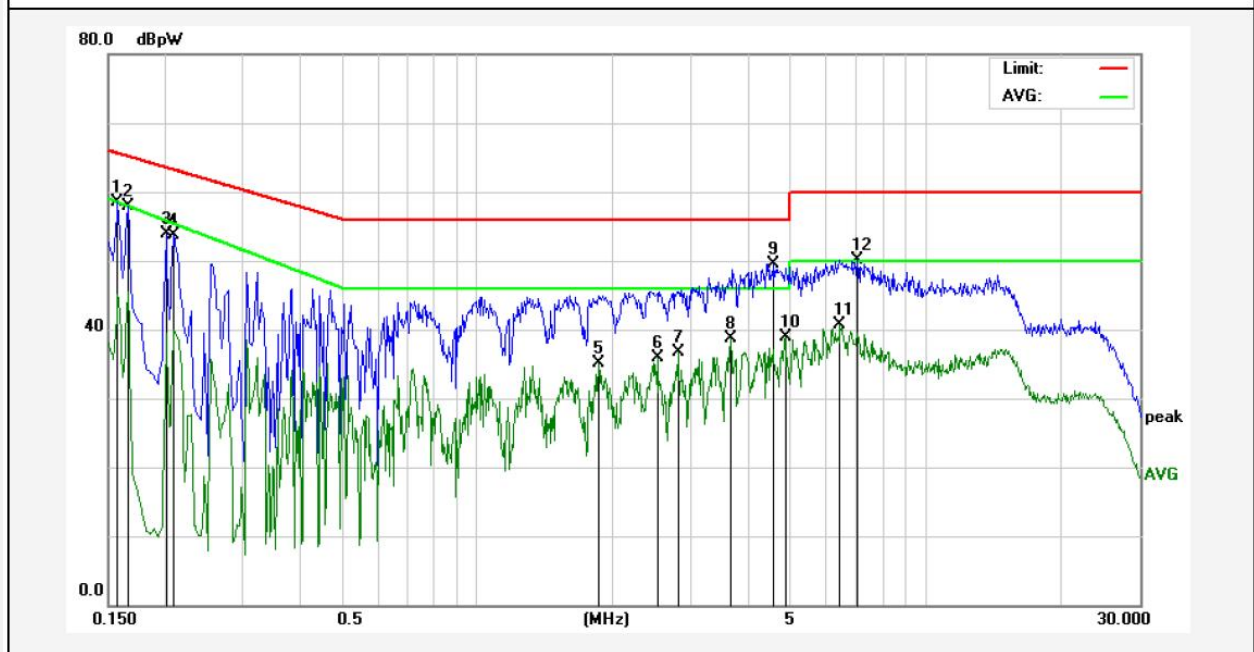


No.	Freq. (MHz)	Reading (dBUV)	Factor (dB)	Result (dBpW)	Limit (dBpW)	Over Limit (dB)	Detector	Remark
1	0.1500	58.80	0.11	58.91	65.99	-7.08	QP	
2	0.1620	54.89	0.12	55.01	65.36	-10.35	QP	
3	0.2060	55.01	0.12	55.13	63.36	-8.23	QP	
4	3.8700	34.86	0.12	34.98	46.00	-11.02	AVG	
5	6.2140	40.90	0.11	41.01	50.00	-8.99	AVG	
6	6.7540	50.02	0.11	50.13	60.00	-9.87	QP	
7	7.5220	38.55	0.11	38.66	50.00	-11.34	AVG	
8	8.2580	50.56	0.12	50.68	60.00	-9.32	QP	
9	8.6420	37.72	0.12	37.84	50.00	-12.16	AVG	
10	9.7500	48.28	0.12	48.40	60.00	-11.60	QP	
11	9.7500	37.29	0.12	37.41	50.00	-12.59	AVG	
12	11.4900	37.03	0.13	37.16	50.00	-12.84	AVG	

Note: Result=Reading+Factor Over Limit=Result-Limit

Conducted Emission Test Data

Test Site: 1# Shielded Room
 Test Specification: AC 230V, 50Hz
 Comment: Neutral Line
 Temp.: 23.5°C Hum.: 46%



No.	Freq. (MHz)	Reading (dBUV)	Factor (dB)	Result (dBpW)	Limit (dBpW)	Over Limit (dB)	Detector	Remark
1	0.1580	58.47	0.12	58.59	65.56	-6.97	QP	
2	0.1660	57.84	0.12	57.96	65.15	-7.19	QP	
3	0.2020	53.71	0.12	53.83	63.52	-9.69	QP	
4	0.2100	53.63	0.12	53.75	63.20	-9.45	QP	
5	1.8620	34.98	0.12	35.10	46.00	-10.90	AVG	
6	2.5220	35.76	0.12	35.88	46.00	-10.12	AVG	
7	2.8020	36.54	0.12	36.66	46.00	-9.34	AVG	
8	3.6780	38.53	0.12	38.65	46.00	-7.35	AVG	
9	4.5860	49.48	0.11	49.59	56.00	-6.41	QP	
10	4.8700	38.80	0.11	38.91	46.00	-7.09	AVG	
11	6.4300	40.62	0.11	40.73	50.00	-9.27	AVG	
12	7.0460	50.07	0.11	50.18	60.00	-9.82	QP	

Note: Result=Reading+Factor Over Limit=Result-Limit

3. Disturbance Power Test

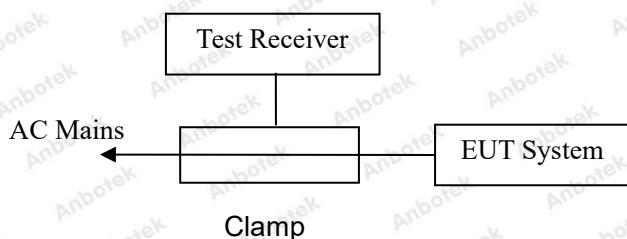
3.1. Test Standard and Limit

Test Standard	EN 55014-1
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Disturbance Power Test Limit

Test Limit	Frequency (MHz)	At mains terminals (dB μ V)	
		Quasi-peak Level	Average Level
	30 ~300	45 Increasing Linearly with Frequency to 55	35 Increasing Linearly with Frequency to 45

3.2. Test Setup



3.3. EUT Configuration on Measurement

The EN 55014-1 Regulations test method must be used to find the maximum emission during disturbance power measurement. The configuration of the EUT is the same as used in conducted emission measurement.

3.4. Operating Condition of EUT

3.4.1. Setup the EUT as shown in Section 3.2.

3.4.2. Turn on the power of all equipments.

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

3.5. Test Procedure

The EUT is placed on the ground and away from other metallic surface at least 0.1m. It is connected to the power mains through an extension cord of 6m min. The absorber clamp clamps the cord and moves from the far end to the EUT to measure the disturbing energy emitted from the cord.

The bandwidth of the test receiver(R&S ESCI) is set at 120kHz.

All the test results are listed in Section 3.6.

3.6. Test Results

PASS

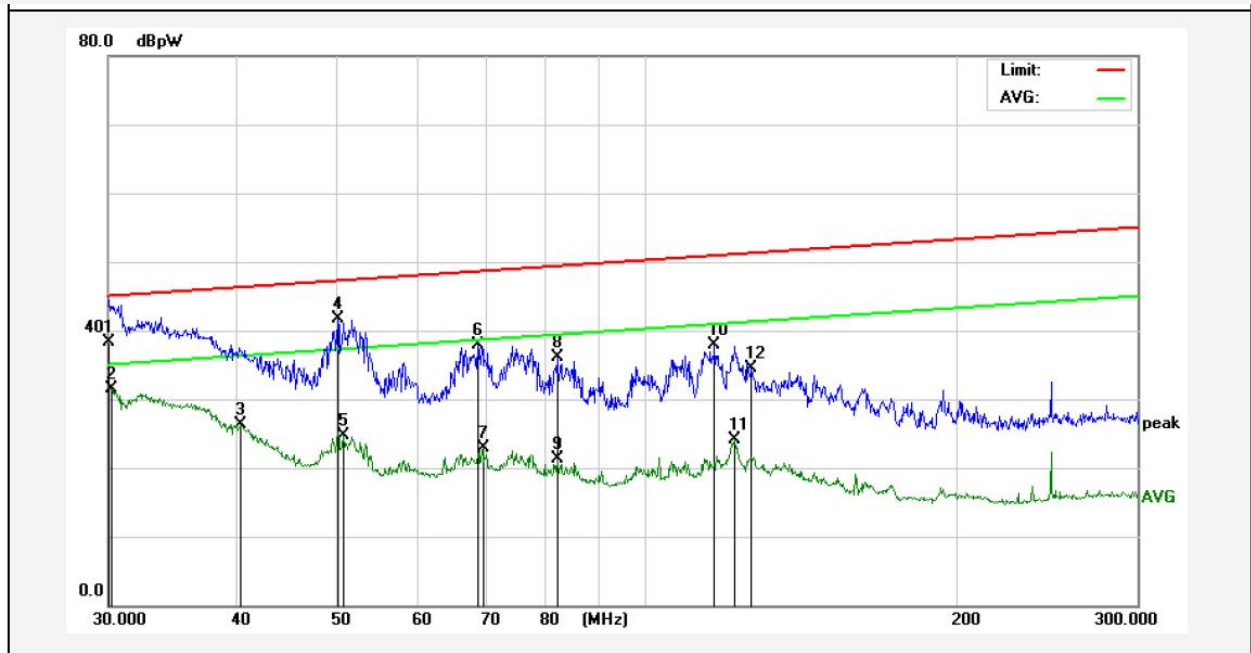
The frequency spectrum from 30MHz to 300MHz is investigated.

The test curves are shown in the following pages.



Power Clamp Test Data

Test Site: 1# Shielded Room
 Test Specification: AC 230V, 50Hz
 Comment: DC LINE
 Temp.: 23.5°C Hum.: 46%



No.	Freq. (MHz)	Reading (dBpW)	Factor (dB)	Result (dBpW)	Limit (dBpW)	Over Limit (dB)	Detector	Remark
1	30.1200	10.32	27.89	38.21	45.02	-6.81	QP	
2	30.1600	3.67	27.89	31.56	35.02	-3.46	AVG	
3	40.4000	-0.99	27.22	26.23	36.29	-10.06	AVG	
4	50.2000	15.83	25.88	41.71	47.24	-5.53	QP	
5	50.8000	-1.05	25.84	24.79	37.29	-12.50	AVG	
6	68.7200	11.61	26.27	37.88	48.60	-10.72	QP	
7	69.4000	-3.57	26.39	22.82	38.64	-15.82	AVG	
8	82.0000	11.16	24.96	36.12	49.37	-13.25	QP	
9	82.0000	-3.74	24.96	21.22	39.37	-18.15	AVG	
10	116.5200	13.31	24.54	37.85	50.89	-13.04	QP	
11	121.9600	-0.38	24.40	24.02	41.09	-17.07	AVG	
12	126.6000	10.06	24.50	34.56	51.25	-16.69	QP	

Note: Result=Reading+Factor Over Limit=Result-Limit

Power Clamp Test Data

Test Site: 1# Shielded Room

Shenzhen Anbotek Compliance Laboratory Limited

Address: 1/F., Building D, Sogood Science and Technology Park, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.

Tel: (86) 755-26066440 Fax: (86) 755-26014772 Email: service@anbotek.com

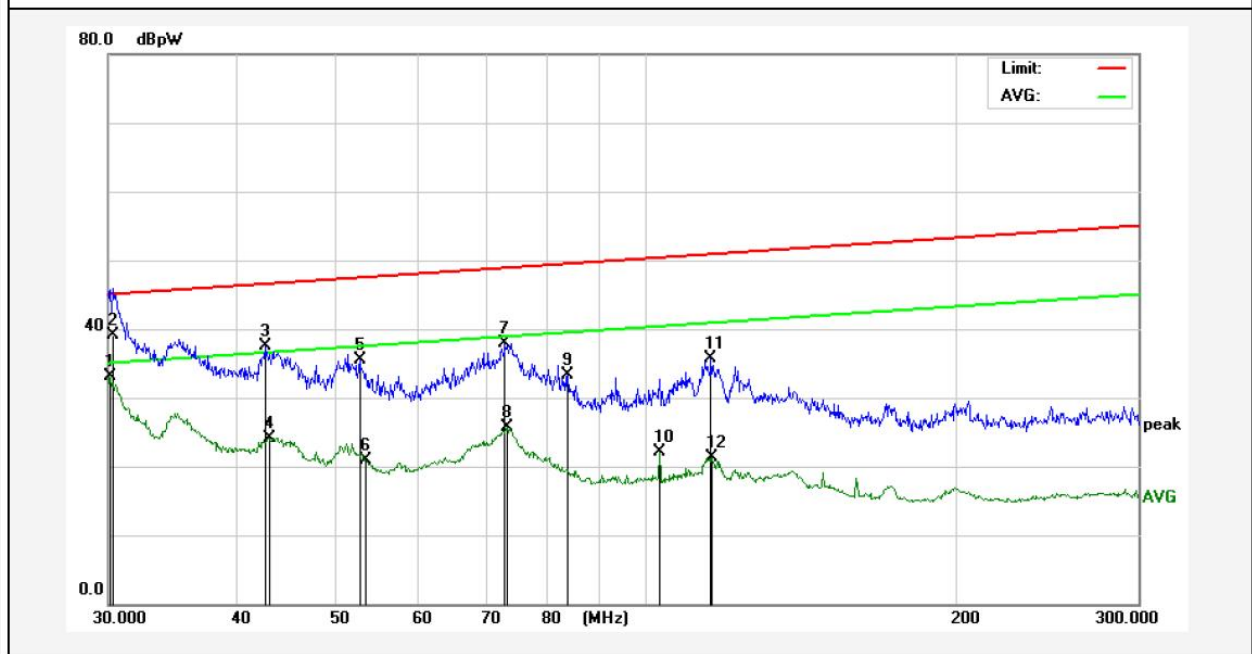
Code:AB-EMC-02-b

Hotline
 400-003-0500
 www.anbotek.com

Test Specification: AC 230V, 50Hz

Comment: AC LINE

Temp.: 23.5°C Hum.: 46%



No.	Freq. (MHz)	Reading (dBpW)	Factor (dB)	Result (dBpW)	Limit (dBpW)	Over Limit (dB)	Detector	Remark
1	30.0800	5.12	27.90	33.02	35.01	-3.19	AVG	
2	30.3200	11.29	27.88	39.17	45.05	-5.88	QP	
3	42.6000	10.69	26.78	37.47	46.52	-9.05	QP	
4	43.0000	-2.56	26.70	24.14	36.56	-12.42	AVG	
5	52.7200	9.77	25.68	35.45	47.45	-12.00	QP	
6	53.4400	-4.73	25.62	20.89	37.51	-16.62	AVG	
7	72.9600	11.64	26.32	37.96	48.86	-10.90	QP	
8	73.2400	-0.70	26.31	25.61	38.88	-13.27	AVG	
9	83.8399	8.48	24.74	33.22	49.46	-16.24	QP	
10	103.0000	-2.43	24.52	22.09	40.36	-18.27	AVG	
11	115.5600	11.10	24.58	35.68	50.86	-15.18	QP	
12	115.6800	-3.30	24.57	21.27	40.86	-19.59	AVG	

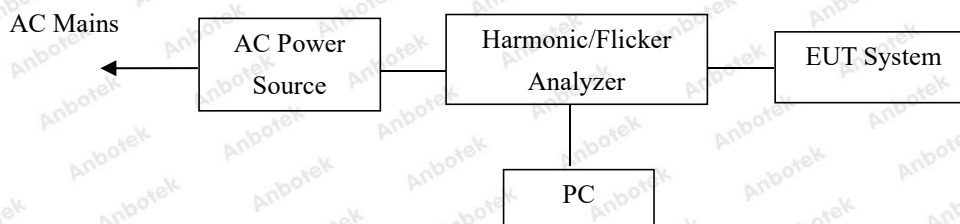
Note: Result=Reading+Factor Over Limit=Result-Limit

4. Harmonic Current Emission Test

4.1. Test Standard

Test Standard	EN IEC 61000-3-2
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4.2. Test Setup



4.3. Operating Condition of EUT

4.3.1. Setup the EUT as shown on Section 5.2.

4.3.2. Turn on the power of all equipments.

4.3.3. After that, let the EUT work in test mode measure it.

4.4. Test Results

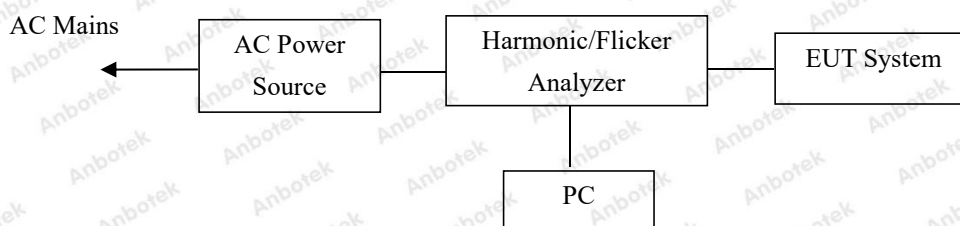
The active input power of the EUT is less than 75W. Therefore, according to EN IEC 61000-3-2, no limits are necessary.

5. Voltage Fluctuations & Flicker Test

5.1. Test Standard

Test Standard	EN 61000-3-3
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5.2. Test Setup



5.3. Operating Condition of EUT

5.3.1. Setup the EUT as shown on Section 6.2.

5.3.2. Turn on the power of all equipments.

5.3.3. After that, let the EUT work in test mode measure it.

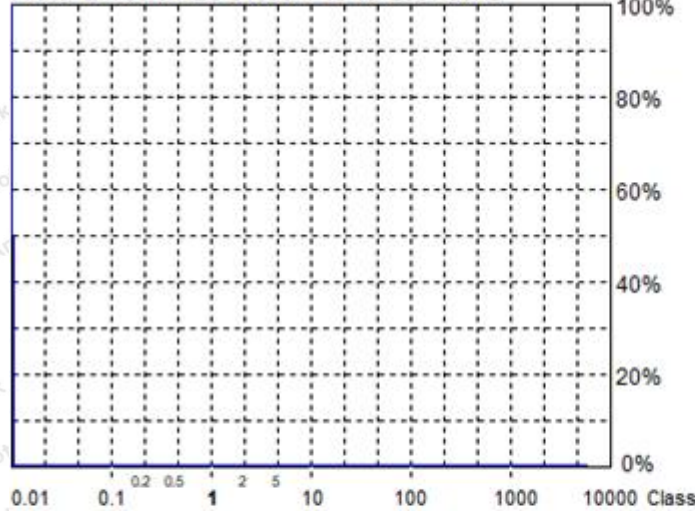
5.4. Test Results

PASS

The test curves are shown in the following pages.

Flicker Test Summary (Run time)

Flicker Emission IEC 61000-4-15 for 230V/50Hz



Actual Flicker (Fli):	0.00
Short-term Flicker (Pst):	0.07
Limit (Pst):	1.00
Long-term Flicker (Plt):	0.00
Limit (Plt):	0.65
Maximum Relative Volt. Change (dmax):	0.00%
Limit (dmax):	4.00%
Relative Steady-state Voltage Change (dc):	0.00%
Limit (dc):	3.00%
Tmax 3.00% (dt):	0.00ms
Limit (dt>Lim):	200ms

Flicker Emission - IEC 61000-3-3, EN 61000-3-3

Urms = 229.3 V P = 19.68 W
 Irms = 0.211 A pf = 0.407

Range: 2 A
 V-nom: 230 V

Test aborted, Result: PASSED

HAR-1000 EMC-Partner

Full Bar : Actual Values
Empty Bar : Maximum Values
Circles : Average Values
Blue : Current , Green : Voltage , Red : Failed

Urms = 229.3V Freq = 50.000 Range: 2 A
Irms = 0.211A Ipk = 1.011A cf = 4.792
P = 19.68W S = 48.37VA pf = 0.407

Test - Time : 10 x 1min = 10min (100 %)

LIN (Line Impedance Network) : L: 0.24ohm +j0.15ohm N: 0.16ohm +j0.10ohm

Limits : Plt : 0.65 Pst : 1.00
dmax : 4.00 % dc : 3.00 %
dtLim: 3.00 % dt>Lim: 200ms

Test aborted, Result: PASSED

	dmax	dc	dt>Lim
	[%]	[%]	[ms]
1	0.000	0.000	0.000

6. Electrostatic Discharge Immunity Test

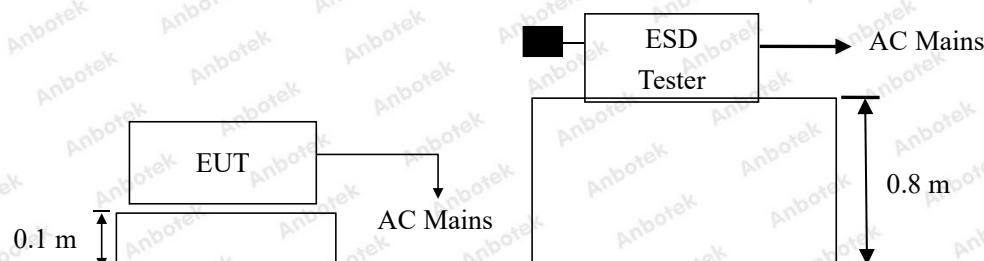
6.1. Test Standard and Level

Test Standard:	EN 55014-2 (IEC 61000-4-2)
Performance Criterion:	B
Severity Level: 3 / Air Discharge: $\pm 8\text{kV}$, Level: 2 / Contact Discharge: $\pm 4\text{kV}$	

Test Level

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

6.2. Test Setup



6.3. EUT Configuration on Measurement

The following equipments are installed on Electrostatic Discharge immunity Measurement to meet EN 55014-2 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

6.4. Operating Condition of EUT

- 6.4.1. Setup the EUT as shown on Section 6.2.
- 6.4.2. Turn on the power of all equipments.
- 6.4.3. After that, let the EUT work in test mode measure it.

6.5. Test Procedure

6.5.1. Air Discharge:

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

6.5.2. Contact Discharge:

All the procedure shall be same as Section 6.5.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

6.5.3. Indirect discharge for horizontal coupling plane

At least 20 single discharges shall be 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.

6.5.4. Indirect discharge for vertical coupling plane

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

6.6. Test Results

PASS

Please refer to the following page.



Electrostatic Discharge Test Results

Air discharge :	±8.0kV	Temperature :	23.5℃
Contact discharge :	±4.0kV	Humidity :	52%
Power Supply :	AC 230V, 50Hz / DC 28.8V	Expert conclusion:	A
Number of discharge :	10	Test Result:	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
Location		Kind A-Air Discharge C-Contact Discharge	Result
Slot	4 points	A	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
Button	4 points	A	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
Screen	4 points	A	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
Light	4 points	A	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
Metal	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
HCP	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
VCP of the front	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
VCP of the rear	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
VCP of the left	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
VCP of the right	4 points	C	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
<p>Remark: Discharge should be considered on Contact and Air and Horizontal Coupling Plane (HCP) and Vertical Coupling Plane (VCP).</p>			

7. RF Field Strength Susceptibility Test

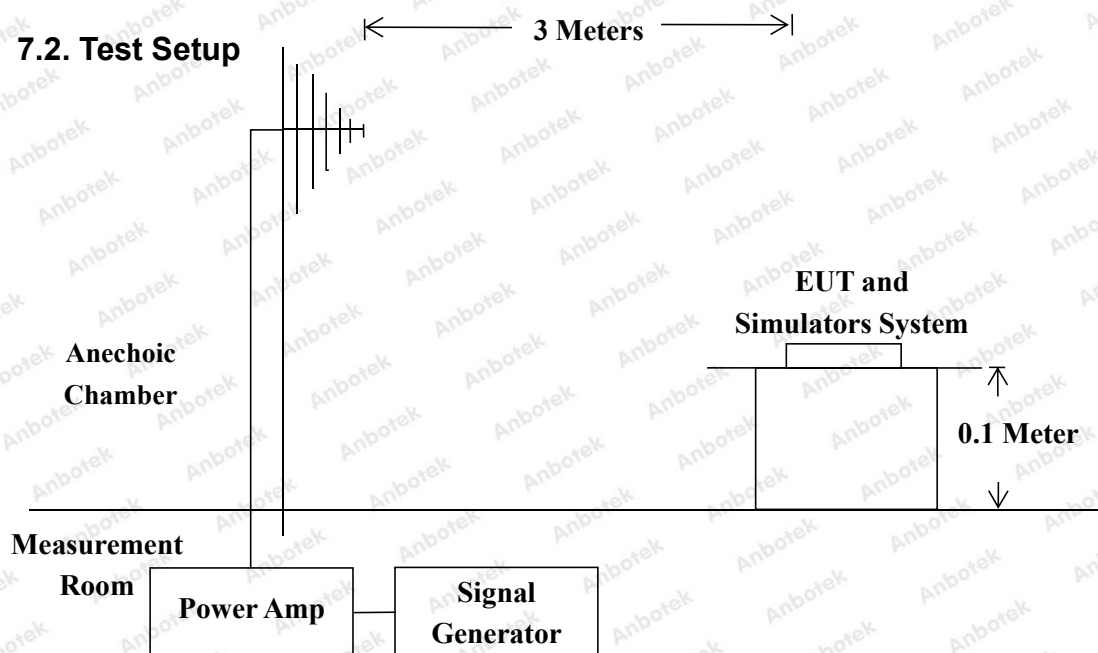
7.1. Test Standard and Level

Test Standard:	EN 55014-2 (IEC 61000-4-3)
Required Performance:	A
Frequency Range:	80MHz to 1000MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % of preceding frequency value
Polarity of Antenna:	Horizontal and Vertical
Test Distance:	3 m
Antenna Height:	1.5 m
Dwell Time:	at least 0.5s

Test Level

Level	Field Strength V/m
1.	1
2.	3
3.	10
X.	Special

7.2. Test Setup



7.3. EUT Configuration on Measurement

The following equipments are installed on RF Field Strength susceptibility Measurement to meet EN 55014-2 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

7.4. Operating Condition of EUT

- 7.4.1. Setup the EUT as shown on Section 7.2.
- 7.4.2. Turn on the power of all equipments.
- 7.4.3. After that, let the EUT work in test mode measure it.

7.5. Test Procedure

The EUT and support equipment, which are placed on a table that is 0.1 meter above ground and the testing was performed in a fully-anechoic chamber. The testing distance from antenna to the EUT was 3 meters.

- 1) The field strength level was 3V/m.
- 2) The frequency range is swept from 80 MHz to 1000 MHz with the signal 80% amplitude modulated with a 1kHz sine wave.
- 3) The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond, but shall in no case be less than 0.5s.
- 4) The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

7.6. Measuring Results

PASS

Please refer to the following page.



RF Field Strength Susceptibility Test Results

Field Strength :	3V/m	Temperature :	23.9℃
Expert conclusion:	A	Humidity :	54%
Power Supply :	AC 230V, 50Hz / DC 28.8V	Test Result :	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
Dwell Time:	1s		

Frequency Range (MHz)	Antenna Polarity	R.F. Field Strength	Azimuth	Result
80~1000	H / V	3 V/m (rms)	Front	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
			Rear	
			Left	
			Right	

8. Electrical Fast Transient/Burst Immunity Test

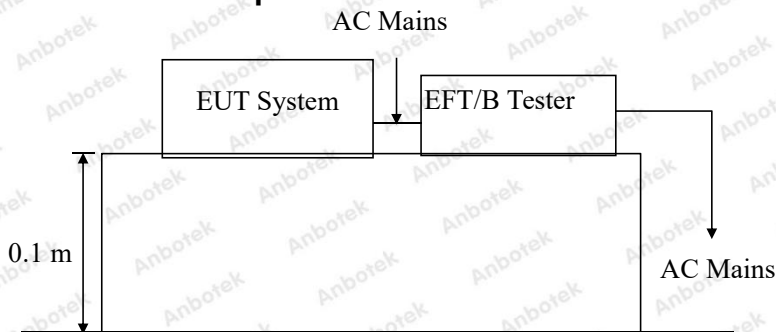
8.1. Test Standard and Level

Test Standard:	EN 55014-2 (IEC 61000-4-4)
Performance criterion:	B
Severity Level 2: 1.00kV	

Test Level

Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1.	0.50 kV	0.25 kV
2.	1.00 kV	0.50 kV
3.	2.00 kV	1.00 kV
4.	4.00 kV	2.00 kV
X.	Special	Special

9.2. Test Setup



8.3. EUT Configuration on Measurement

The following equipments are installed on Electrical Fast Transient/Burst Immunity Measurement to meet EN 55014-2 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

8.4. Operating Condition of EUT

- 8.4.1. Setup the EUT as shown in Section 8.2.
- 8.4.2. Turn on the power of all equipments.
- 8.4.3. Let the EUT work in test mode and measure it.

8.5. Test Procedure

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

8.5.1. For input and output AC power ports:

The EUT is connected to the power mains by using a coupling device which couples the EFT interference signal to AC power lines. Both polarities of the test voltage should be applied during compliance test and the duration of the test is 2 mins.

8.5.2. For signal lines and control lines ports:

Select tests based on product characteristics.

8.5.3. For DC output line ports:

Select tests based on product characteristics.

8.6. Test Results

PASS

Please refer to the following page.

Electrical Fast Transient/Burst Test Results

Ambient Condition : 23.5°C / 52% RH		Expert conclusion: A	
Power Supply : AC 230V, 50Hz, DC 28.8V		Test Result : <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	
Inject Line : AC Mains		Inject Method: Direct	Inject Time(s): 120
Line	Polarity	Test Voltage (kV)	Result
AC Line	±	1.00kV	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
DC Line			
Signal Line			

9. Surge Immunity Test

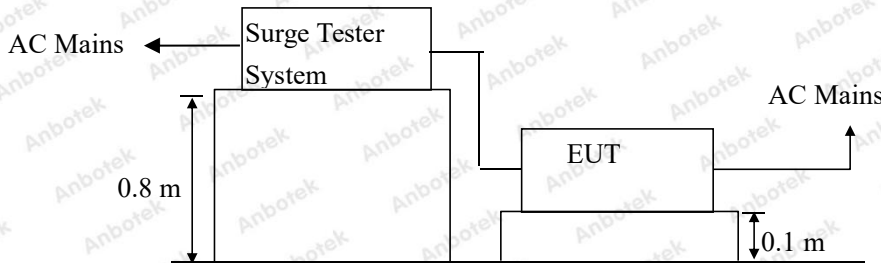
9.1. Test Standard and Level

Test Standard:	EN 55014-2 (IEC 61000-4-5)
Performance criterion:	B
Severity Level 2, Line to Line: 1.0kV; Severity Level 3, Line to Earth: 2.0kV	

Test Level

Severity Level	Open-Circuit Test Voltage (kV)
1.	0.5
2.	1.0
3.	2.0
4.	4.0
X.	Special

9.2. Test Setup



9.3. EUT Configuration on Measurement

The following equipments are installed on Surge immunity Measurement to meet EN 55014-2 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

9.4. Operating Condition of EUT

- 9.4.1. Setup the EUT as shown in Section 9.2.
- 9.4.2. Turn on the power of all equipments.
- 9.4.3. Let the EUT work in test mode and measure it.

9.5. Test Procedure

9.5.1. Set up the EUT and test generator as shown on Section 9.2.

9.5.2. 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.

9.5.3. For line to earth coupling mode, provide a 2.0kV 1.2/50us voltage surge (at open-circuit condition) and 8/20us current surge to EUT selected points.

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

9.5.5. Different phase angles are done individually.

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

9.6. Test Results

PASS

Please refer to the following page.



Surge Immunity Test Results

Humidity :	52%		Temperature :	23.5°C	
Power Supply :	AC 230V, 50Hz		Expert conclusion:	A	
Test Result :	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail				
Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (kV)	Result
L-N	+	<input type="checkbox"/> 0° <input checked="" type="checkbox"/> 90° <input type="checkbox"/> 180° <input type="checkbox"/> 270°	5	1.0kV	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
L-N	-	<input type="checkbox"/> 0° <input type="checkbox"/> 90° <input type="checkbox"/> 180° <input checked="" type="checkbox"/> 270°	5	1.0kV	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D



10. Injected Currents Susceptibility Test

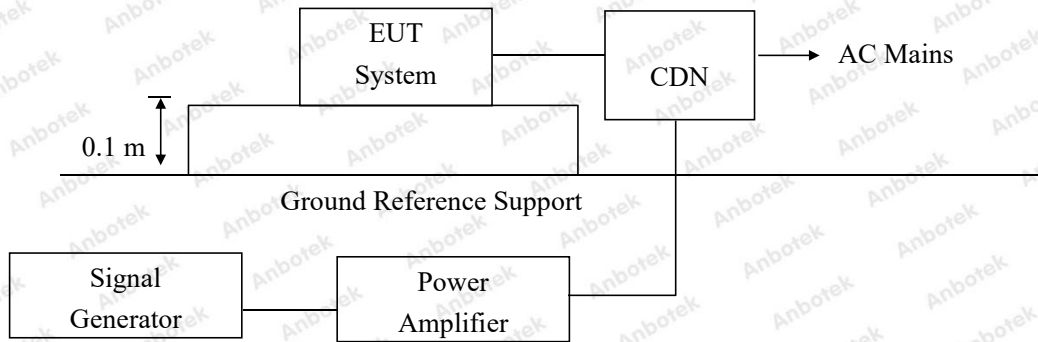
10.1. Test Standard and Level

Test Standard	EN 55014-2 (IEC 61000-4-6)
Performance criterion	A
Severity Level 2: 3V (rms), (0.15MHz ~80MHz)	

Test Level

Level	Field Strength V
1.	1
2.	3
3.	10
X.	Special

10.2. Test Setup



10.3. EUT Configuration

The following equipments are installed on currents susceptibility Measurement to meet EN 55014-2 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

10.4. Operating Condition of EUT

- 10.4.1. Setup the EUT as shown in Section 10.2.
- 10.4.2. Turn on the power of all equipments.
- 10.4.3. Let the EUT work in test mode and measure it.

10.5. Test Procedure

- 1) Set up the EUT, CDN and test generators as shown on Section 10.2.
- 2) Let the EUT work in test mode and measure it.
- 3) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 4) The disturbance signal described below is injected to EUT through CDN.
- 5) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 6) The frequency range is swept from 150KHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1KHz sine wave.
- 7) The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 8) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

10.5.1. For signal lines and control lines ports:

Select tests based on product characteristics.

10.5.2. For DC output line ports:

Select tests based on product characteristics.

10.6. Test Results

PASS

Please refer to the following page.

Injected Currents Susceptibility Test Results

Humidity : 51%		Temperature : 23.6°C	
Power Supply : AC 230V, 50Hz		Expert conclusion: A	
Test Result : <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail			
Frequency Range (MHz)		Injected Position	Strength (Unmodulated)
0.15 ~ 80	AC Mains	3V	<input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D
<p>Remark : 1. Modulation Signal:1KHz 80% AM</p>			

11. Voltage Dips And Interruptions Test

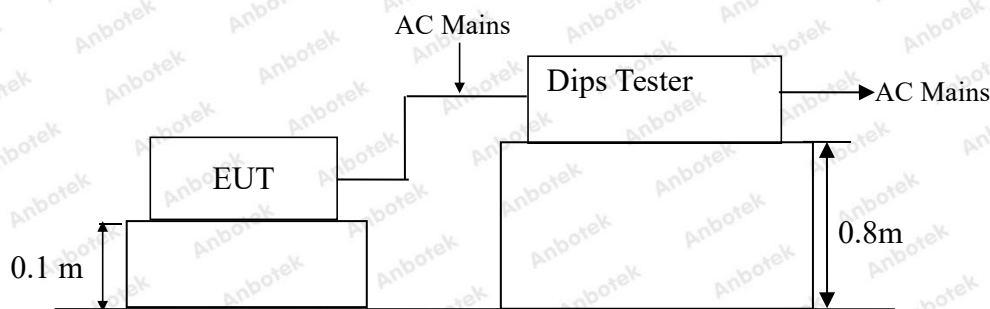
11.1. Test Standard and Level

Test Standard:	EN 55014-2 (IEC 61000-4-11)
Performance Criterion:	C

Test Level

Test Level %UT	Voltage dip and short interruptions %UT	Duration (in period)
0	100	0.5
40	60	1
70	30	5
/	/	10
		25
		50
		*

11.2. Test Setup



11.3. EUT Configuration on Measurement

The following equipments are installed on Voltage dips and interruptions Measurement to meet EN 55014-2 requirements and operating in a manner which tends to maximize its emission characteristics in a normal application.

11.4. Operating Condition of EUT

- 11.4.1. Setup the EUT as shown in Section 11.2.
- 11.4.2. Turn on the power of all equipments.
- 11.4.3. Let the EUT work in test mode and measure it.

11.5. Test Procedure

- 1) Set up the EUT and test generator as shown on Section 11.2.
- 2) The interruptions is introduced at selected phase angles with specified duration.
- 3) Record any degradation of performance.

11.6. Test Results

PASS

Please refer to the following page.



Voltage Dips and Interruptions Test Results

Temperature : 23.5°C		Humidity : 52%	
Power Supply : AC 230V, 50Hz		Expert conclusion: C	
Test Result : <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail			
Test Level % UT	Voltage Dips & Short Interruptions % UT	Duration (in periods)	Result
0	100	0.5P	<input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D
40	60	10P	<input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D
70	30	25P	<input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D
Test Level % UT	Voltage Dips & Short Interruptions % UT	Duration (in periods)	Result

APPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Power Line Conducted Emission Test



Photo of Disturbance Power Test



Photo of Flicker/ Harmonic Test



Photo of Electrostatic Discharge Immunity Test

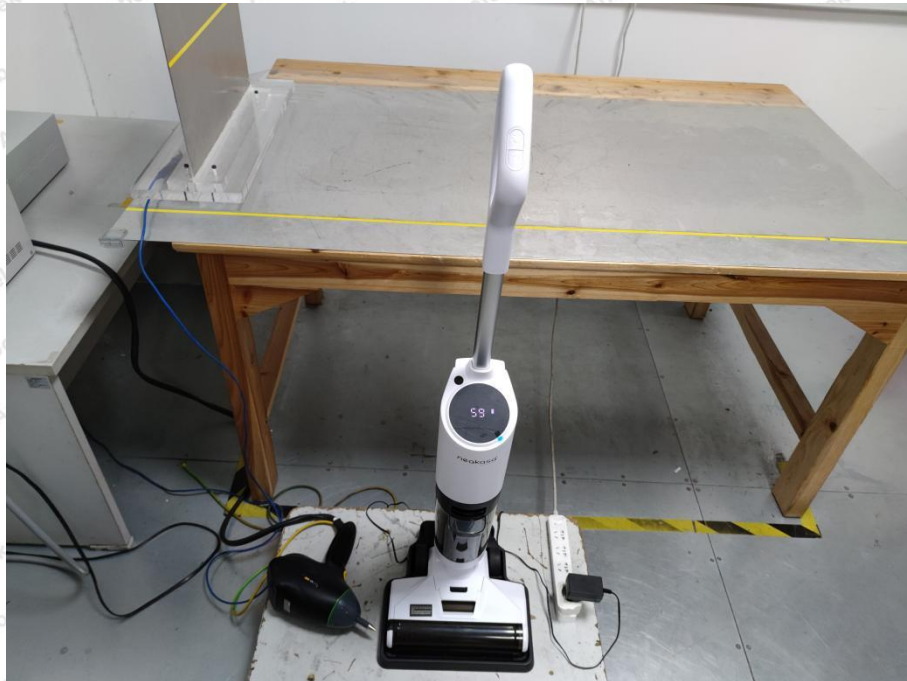


Photo of RF Field Strength susceptibility Test

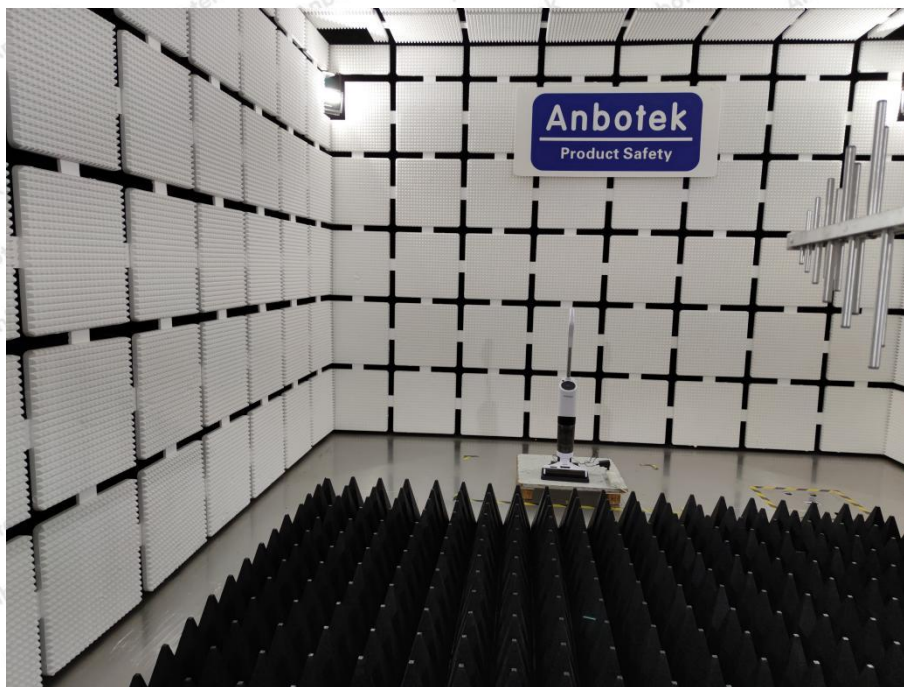


Photo of Electrical Fast Transient/Burst Immunity Test

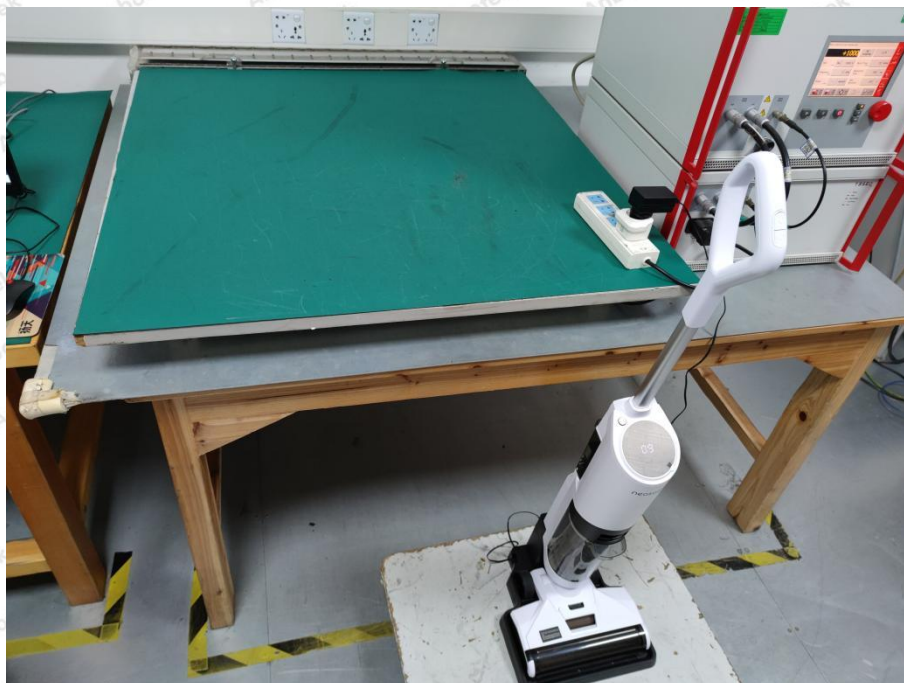


Photo of Surge Immunity Test



Photo of Injected currents susceptibility Test

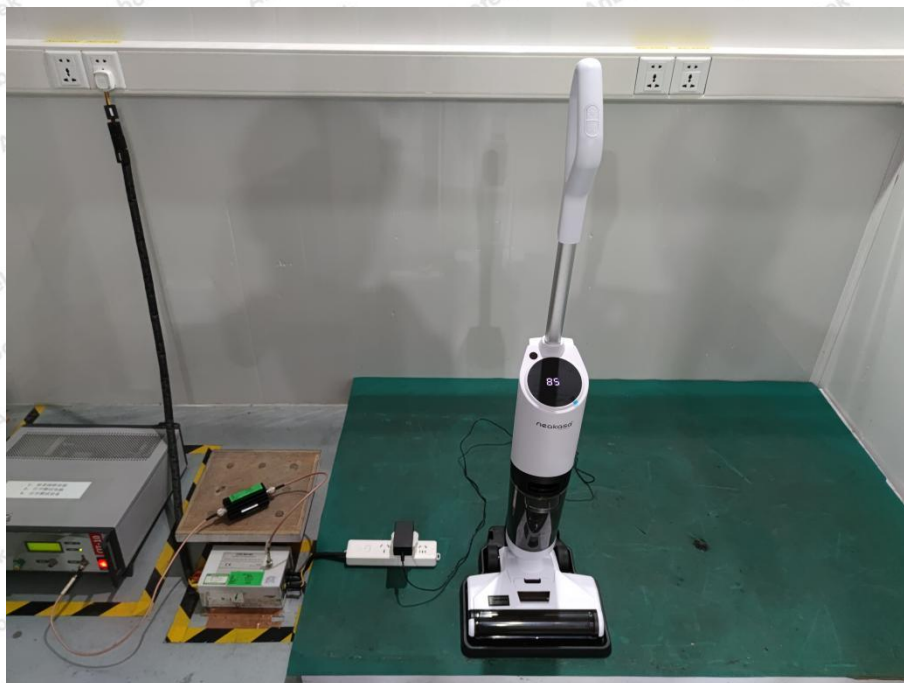


Photo of Voltage Dips and Interruptions Test



APPENDIX II -- Photo documentation

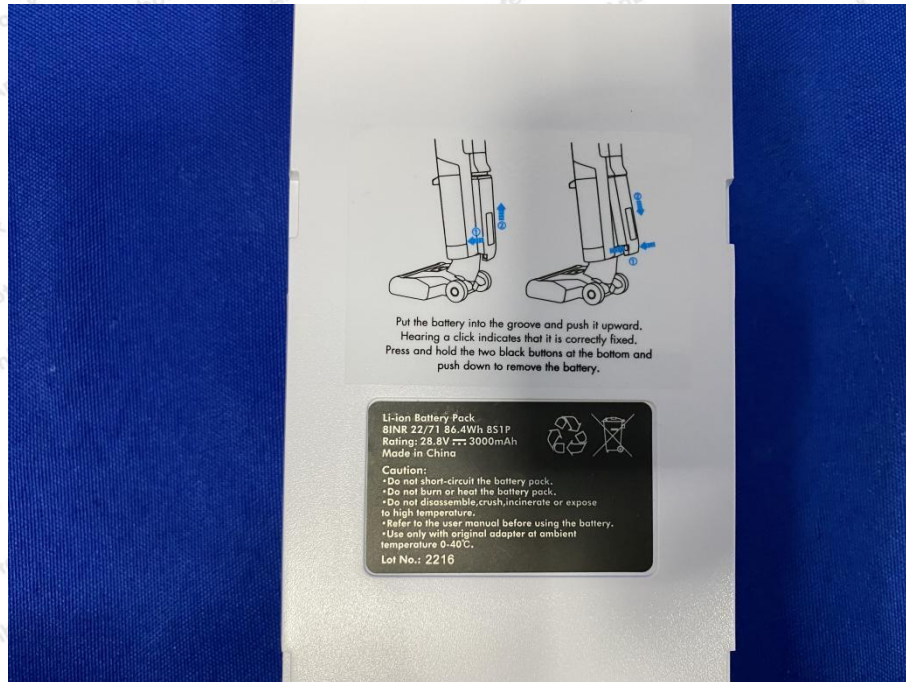




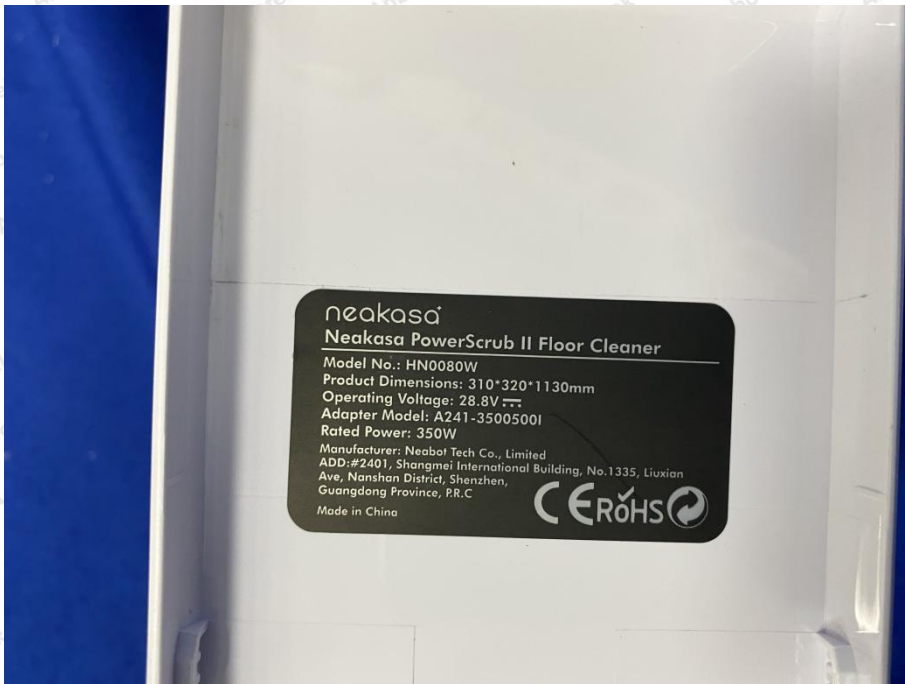


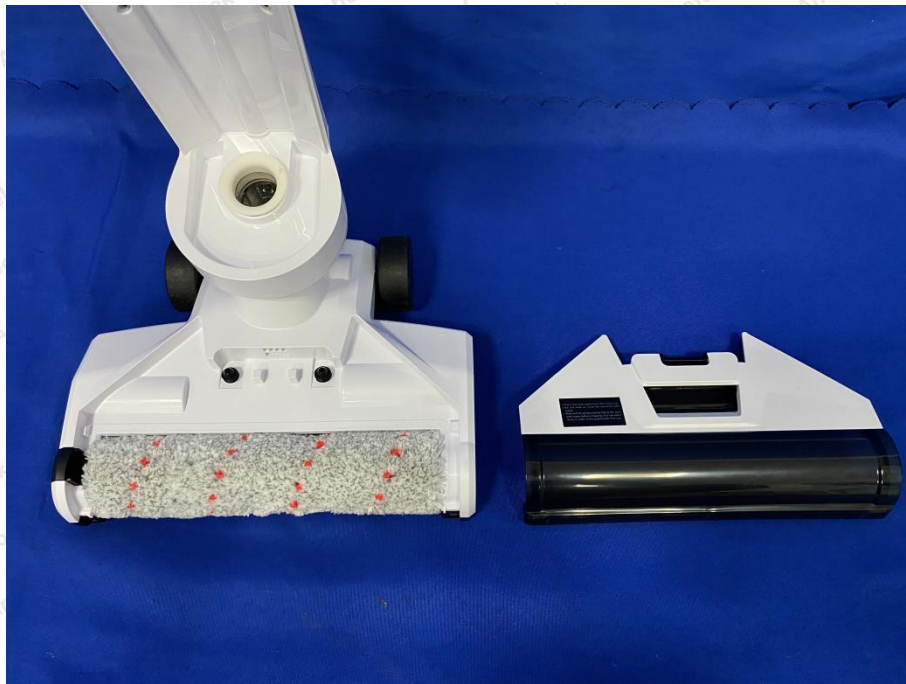


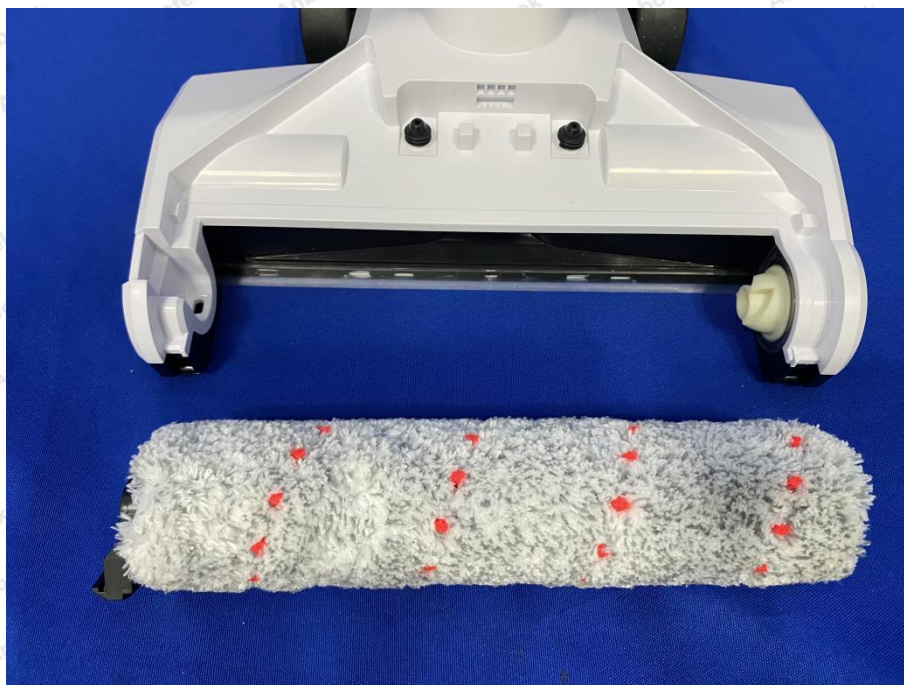


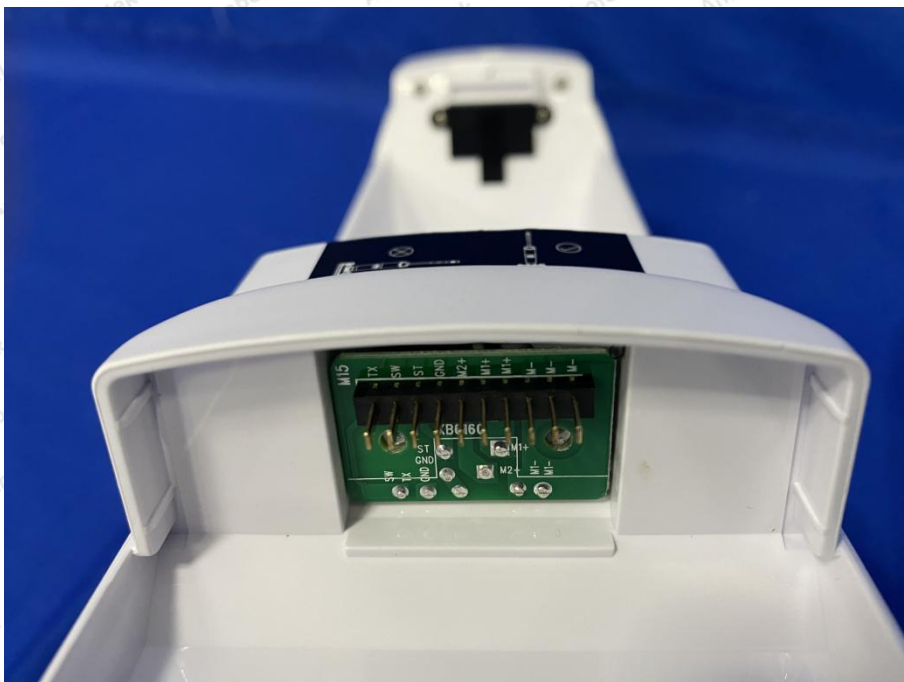
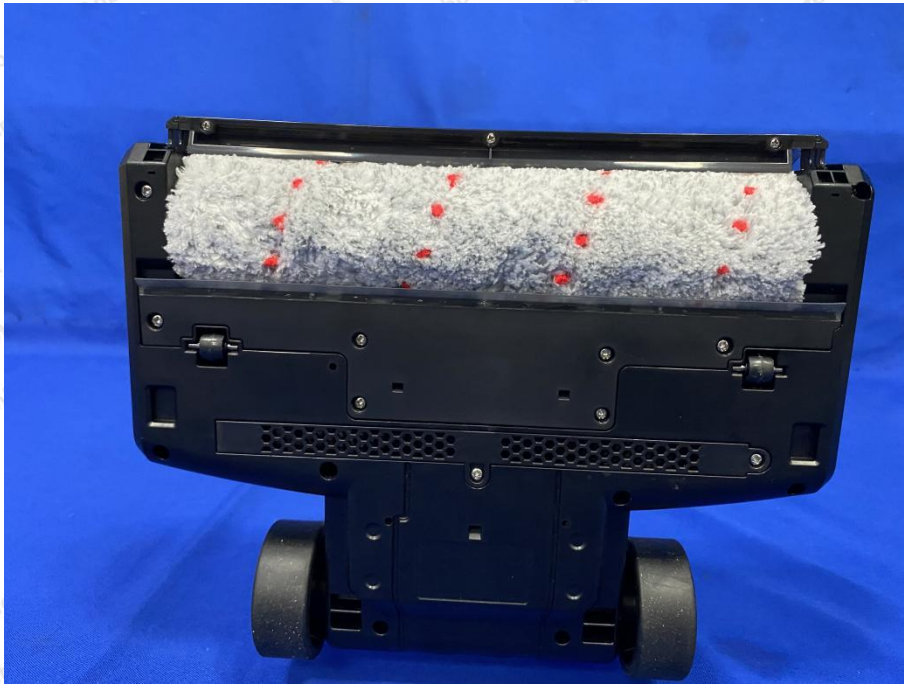


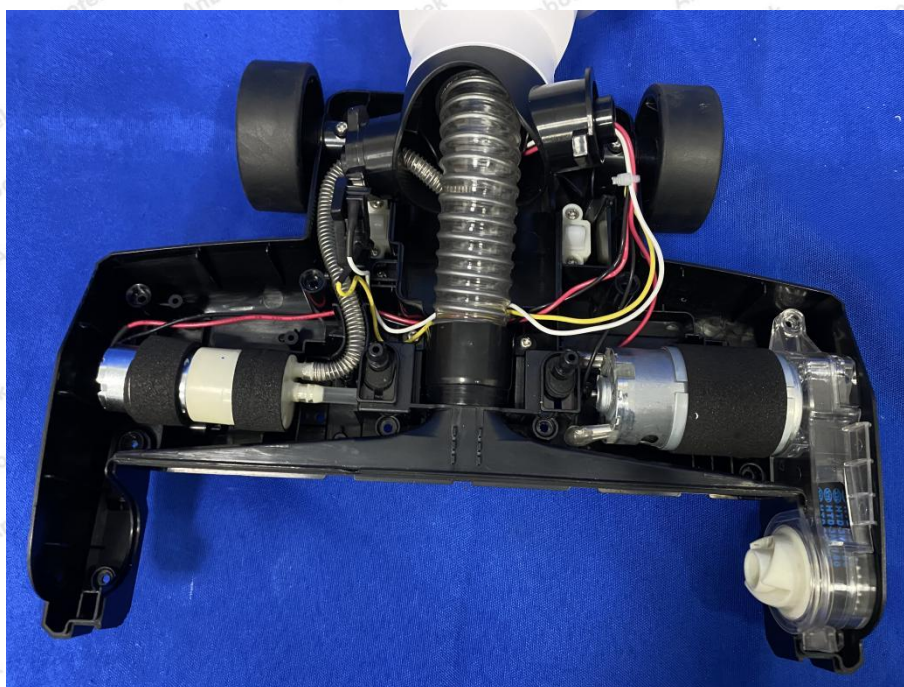
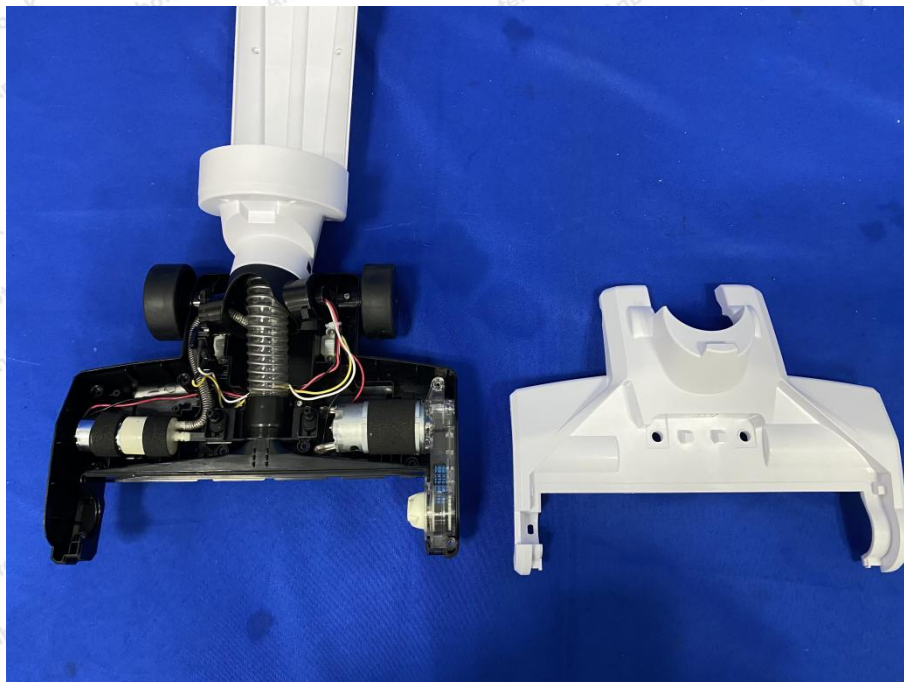


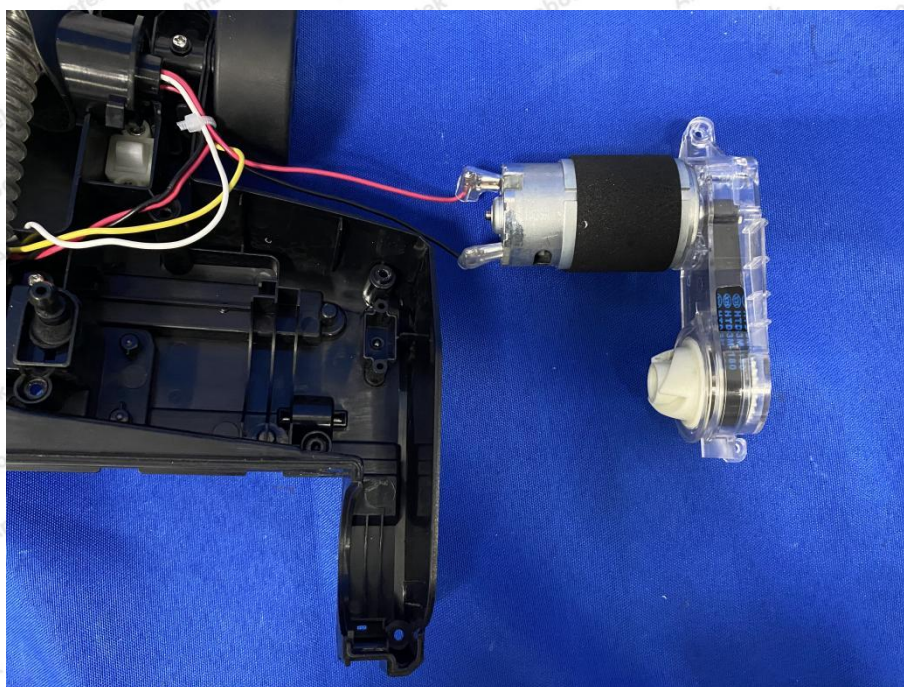
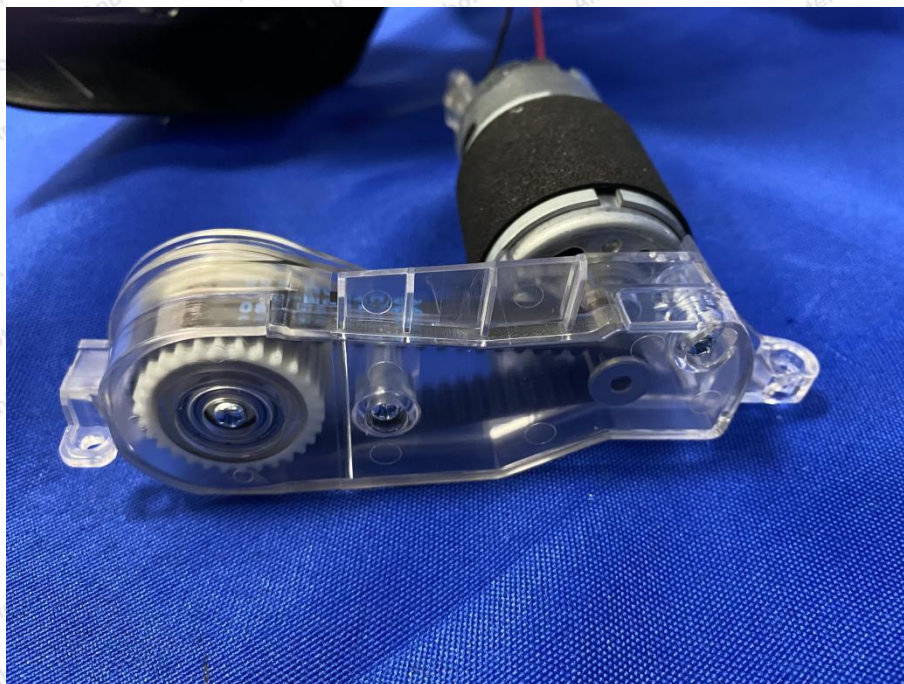


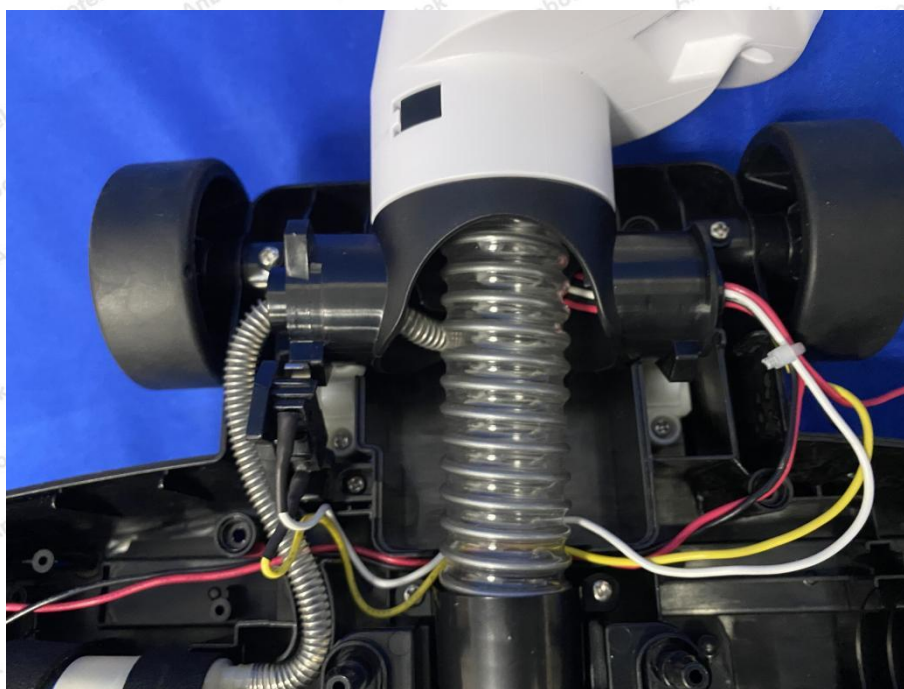
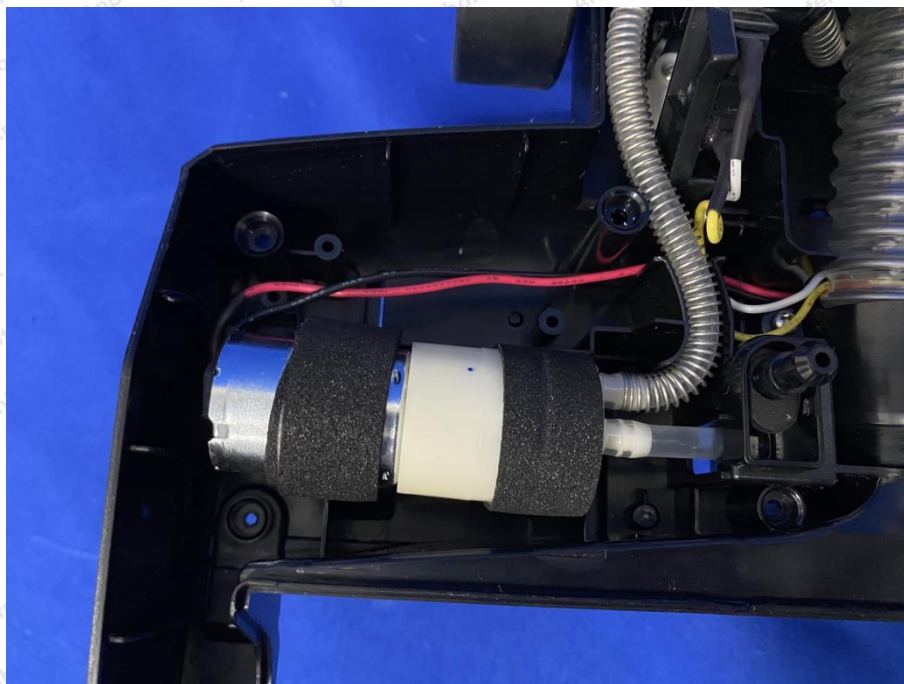














CE Label

1. The CE conformity marking must consist of the initials 'CE' taking the following form:

If the CE marking is reduced or enlarged, the proportions given in the above graduated drawing must be respected.

2. The CE marking must have a height of at least 5 mm except where this is not possible on account of the nature of the apparatus.

3. The CE marking must be affixed to the product or to its data plate. Additionally it must be affixed to the packaging, if any, and to the accompanying documents.

4. The CE marking must be affixed visibly, legibly and indelibly.

It must have the same height as the initials 'CE'.

----- End of Report -----

