EMC TEST REPORT
For

Guangdong Well-born Electric Appliance Co., Ltd.

Electric Water Heater

Test Model: NFSJ300VLA10

Additional Model No.: See Model List

Prepared for	:	Guangdong Well-born Electric Appliance Co., Ltd.
Address	:	No. 15 HuaTian Road, South First Road, Ronggui, Shunde, Foshan, Guangdong
Prepared by	:	Shenzhen AOCE Electronic Technology Service Co., Ltd.
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Date of receipt of test sample	:	May 7, 2025
Number of tested samples	:	1
Date of Test	:	May 7, 2025 ~ May 15, 2025
Date of Report	:	May 15, 2025

EMC TEST REPORT
EN IEC 55014-1: 2021
Requirements for household appliances, electric tools and similar apparatus -- Part 1: Emission
EN IEC 55014-2: 2021
Requirements for household appliances, electric tools and similar apparatus -- Part 2: Immunity - Product family standard

Report Reference No. .....:	**AOC250515111E**
Date Of Issue.....:	May 15, 2025
Testing Laboratory Name.....:	**Shenzhen AOCE Electronic Technology Service Co., Ltd.**
Address.....:	Room 202, 2nd Floor, No.12th Building of Xinhe Tongfuyu Industrial Park, Fuhai Street, Baoan District, Shenzhen, Guangdong, China
Testing Location/ Procedure...:	Full application of Harmonised standards ■ Partial application of Harmonised standards □ Other standard testing method □
Applicant's Name.....:	**Guangdong Well-born Electric Appliance Co., Ltd.**
Address.....:	No. 15 HuaTian Road, South First Road, Ronggui, Shunde, Foshan, Guangdong
Test Specification:	
Standard.....:	EN IEC 55014-1: 2021 EN IEC 61000-3-2:2019+A1:2021+A2:2024 EN 61000-3-3:2013+A1:2019+A2:2021+AC:2022 EN IEC 55014-2: 2021
Test Report Form No.....:	AOCEEMC-1.0
TRF Originator.....:	Shenzhen AOCE Electronic Technology Service Co., Ltd.
Master TRF.....:	Dated 2017-05

Test Item Description.....:	**Electric Water Heater**
Trade Mark.....:	Well-born
Test Model.....:	NFSJ300VLA10
Ratings.....	AC 220-240V, 50/60Hz, 2000W
Result .....:	Positive

Compiled by:	Supervised by:	Approved by:
David Liu/ File administrators	Kevin Huang/ Technique principal	Jackson Fang/ Manager

EMC -- TEST REPORT

Test Report No. : AOC250515111E	May 15, 2025 Date of issue

Test Model.....	: NFSJ300VLA10
EUT.....	: Electric Water Heater
Applicant.....	**: Guangdong Well-born Electric Appliance Co., Ltd.**
Address.....	: No. 15 HuaTian Road, South First Road, Ronggui, Shunde, Foshan, Guangdong
Telephone.....	: /
Fax.....	: /
Manufacturer.....	**: Guangdong Well-born Electric Appliance Co., Ltd.**
Address.....	: No. 15 HuaTian Road, South First Road, Ronggui, Shunde, Foshan, Guangdong
Telephone.....	: /
Fax.....	: /
Factory.....	**: Guangdong Well-born Electric Appliance Co., Ltd.**
Address.....	: No. 15 HuaTian Road, South First Road, Ronggui, Shunde, Foshan, Guangdong
Telephone.....	: /
Fax.....	: /

Test Result according to the standards on page 8:	**Positive**

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

This report is compiled based on the data from the original report AOC250213101E

TABLE OF CONTENT

Test Report Description Page

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 (EN IEC 55014-1: 2021)			
Description of Test Item	**Standard**	**Limits**	**Results**
Conducted disturbance at mains terminals	EN IEC 55014-1: 2021	--------	PASS
Clicks measurement	EN IEC 55014-1: 2021	--------	PASS
Disturbance Power	EN IEC 55014-1: 2021	--------	PASS
Radiated disturbance	EN IEC 55014-1: 2021	--------	N/A
Harmonic current emissions	EN IEC 61000-3-2: 2019+A1: 2021+A2: 2024	Class A	PASS
Voltage fluctuations & flicker	EN 61000-3-3: 2013+A1: 2019+A2: 2021+AC: 2022	--------	PASS
IMMUNITY (EN IEC 55014-2: 2021)			
Description of Test Item	**Basic Standard**	**Performance Criteria**	**Results**
Electrostatic discharge (ESD)	EN 61000-4-2: 2009	B	PASS
Radio-frequency, Continuous radiated disturbance	EN 61000-4-3: 2020	A	N/A
Electrical fast transient (EFT)	EN 61000-4-4: 2012	B	PASS
Surge (Input a.c. power ports)	EN 61000-4-5: 2014+A1：2017	B	PASS
Radio-frequency, Continuous conducted disturbance	EN 61000-4-6: 2014	A	PASS
Power frequency magnetic field	EN 61000-4-8: 2010	A	N/A
Voltage dips, 60% reduction	EN 61000-4-11: 2020	C	PASS
Voltage dips, 30% reduction		C	PASS
Voltage interruptions		C	PASS
N/A is an abbreviation for Not Applicable.			

Test mode:		
Mode 1	Normal operation	Record

1.2.Description of Performance Criteria

General Performance Criteria

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

─ essential operational modes and states;

─ tests of all peripheral access (hard disks, floppy disks, printers, keyboard, mouse, etc.);

─ quality of software execution;

─ quality of data display and transmission;

─ quality of speech transmission.

1.2.1.Performance criterion A

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

1.2.2.Performance criterion B

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

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

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

1.2.3.Performance criterion C

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

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

2. GENERAL INFORMATION

2.1.Description of Device (EUT)

EUT : Electric Water Heater

Trade Mark : Well-born

Test Model : NFSJ300VLA10

Power Supply : AC 220-240V, 50/60Hz, 2000W

2.2.Test Facility

EMC Lab. :

2.3.Statement of the Measurement Uncertainty

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

2.4.Measurement Uncertainty

Test	Parameters	Expanded uncertainty (Ulab)	Expanded uncertainty (Ucispr)
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 2.63 dB ± 2.35 dB	± 3.8 dB ± 3.4 dB
Power Disturbance	Level accuracy (30MHz to 300MHz)	± 2.90dB	± 4.5 dB
Electromagnetic Radiated Emission (3-loop)	Level accuracy (9kHz to 30MHz)	± 3.60 dB	± 3.3 dB
Radiated Emission	Level accuracy (9kHz to 30MHz)	± 3.68 dB	N/A
Radiated Emission	Level accuracy (30MHz to 1000MHz)	± 3.48 dB	± 5.3 dB
Radiated Emission	Level accuracy (above 1000MHz)	± 3.90 dB	± 5.2 dB
Mains Harmonic	Voltage	± 0.510%	N/A
Voltage Fluctuations & Flicker	Voltage	± 0.510%	N/A
EMF		± 21.59%	N/A

(1) Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

(2) The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

3. MEASURING DEVICES AND TEST EQUIPMENT

3.1.Conducted Disturbance

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Software	AUDIX	E3	/	N/A
2	EMI Test Receiver	R&S	ESPI	101840	2024/04/13
3	Artificial Mains	R&S	ENV216	101288	2024/04/13
4	10dB Attenuator	SCHWARZBECK	MTS-IMP-136	261115-001-0032	2024/04/13

3.2.Disturbance Power

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Software	AUDIX	E3	/	N/A
2	EMI Test Receiver	R&S	ESPI	101840	2024/04/13
3	Absorbing clamp	R&S	MDS 21	4033	2024/04/13
4	6dB Attenuator	/	/	50FP-006-H3B	2024/04/13

3.3.Harmonic Current

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Power Analyzer Test System	Voltech	PM6000	20000670053	2024/04/13

3.4.Voltage fluctuation and Flicker

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Power Analyzer Test System	Voltech	PM6000	20000670053	2024/04/13

3.5.Electrostatic Discharge

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ESD Simulator	SCHLODER	SESD 230	604035	2024/04/13

3.6.Electrical Fast Transient/Burst

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Immunity Simulative Generator	EM TEST	UCS500 M4	0101-34	2024/04/13

3.7.Surge

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Surge test system	EM test	UCS500 M4	0101-34	2024/04/13

3.8.Conducted Susceptibility

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Simulator	FRANKONIA	CIT-10/75	A126A1195	2024/04/13
2	CDN	FRANKONIA	CDN-M2+M3	A2210177	2024/04/13
3	6dB Attenuator	FRANKONIA	DAM25W	1172040	2024/04/13

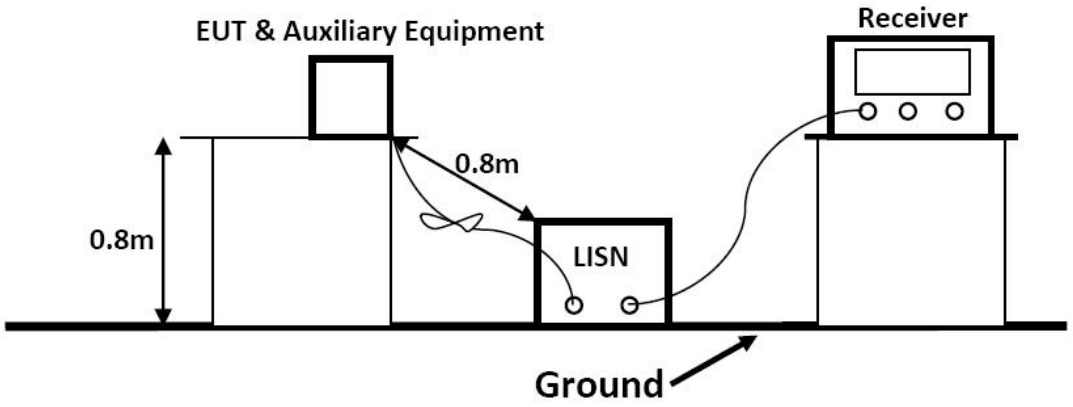
3.9.Voltage Dips					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Voltage dips and up generator	3CTEST	VDG-1105G	EC0171014	2024/04/13

3.10.Voltage Short Interruptions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Voltage dips and up generator	3CTEST	VDG-1105G	EC0171014	2024/04/13

4. TEST RESULTS

4.1.Power Line Conducted Emission Measurement

4.1.1.Block Diagram of Test Setup



4.1.2.Power Line Conducted Emission Limits

Frequency (MHz)	Limit (dBμV)	
	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: * means decreasing linearly with logarithm of frequency.

4.1.3.EUT Configuration on Test

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

4.1.4.Operating Condition of EUT

4.1.4.1.Setup the EUT as shown on Section 4.1.1.

4.1.4.2.Turn on the power of all equipments.

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

4.1.5.Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and connected to the AC mains through a 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 IEC 55014-1 regulations during conducted emission measurement.

The bandwidth of the field strength meter is set at 9kHz.

The frequency range from 150kHz to 30MHz is investigated. The scanning waveform please refer to the next page.

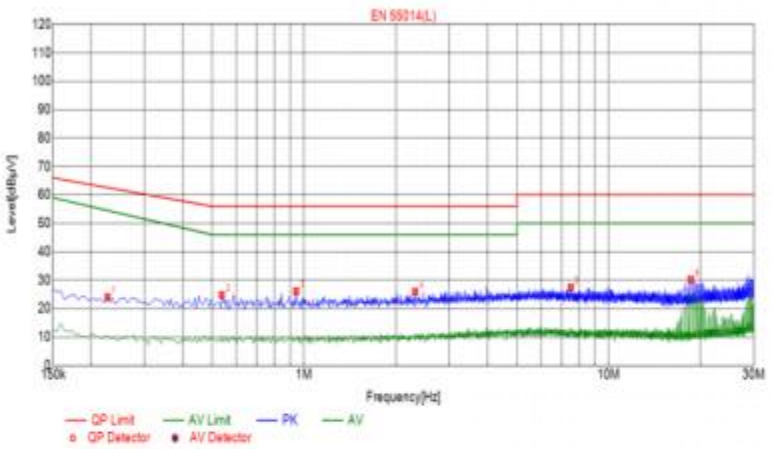
4.1.6.Test Results

PASS.

The frequency range 150kHz to 30MHz is investigated.

Test Model	NFSJ300VLA10	Test Mode	Mode 1
Pol	Line	Test Engineer	Andy

Test Graph

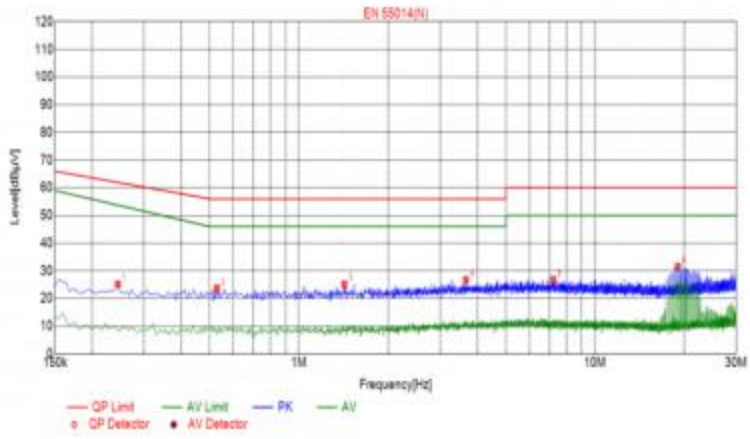


Suspected List

NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.2265	24.07	20.03	62.69	38.62	4.04	PK	L
2	0.5370	24.87	20.05	56.00	31.13	4.82	PK	L
3	0.9420	26.15	20.06	56.00	29.85	6.09	PK	L
4	2.3190	26.01	20.18	56.00	29.99	5.83	PK	L
5	7.5120	27.50	20.17	60.00	32.50	7.33	PK	L
6	18.6045	30.28	20.05	60.00	29.72	10.23	PK	L

Test Model	NFSJ300VLA10	Test Mode	Mode 1
Pol	Neutral	Test Engineer	Andy

Test Graph



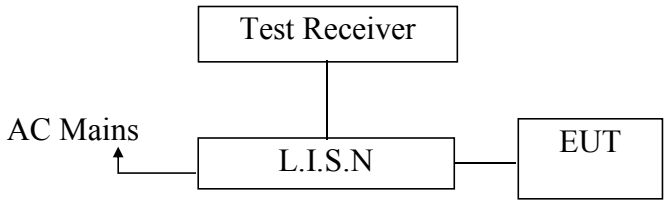
Suspected List

NO.	Freq. [MHz]	Level [dBµV]	Factor [dB]	Limit [dBµV]	Margin [dB]	Reading [dBµV]	Detector	Type
1	0.2445	25.19	20.03	62.06	36.87	5.16	PK	N
2	0.5280	23.68	20.04	56.00	32.32	3.64	PK	N
3	1.4235	25.16	20.11	56.00	30.84	5.05	PK	N
4	3.6645	26.78	20.25	56.00	29.22	6.53	PK	N
5	7.2240	26.81	20.19	60.00	33.19	6.62	PK	N
6	19.0590	31.56	20.07	60.00	28.44	11.49	PK	N

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

4.2. Clicks Measurement

4.2.1.Block Diagram of Test Setup



(EUT: Electric Water Heater)

4.2.2.Clicks Measurement Standard and limit

4.2.2.1.Test Standard

EN IEC 55014-1: 2021

4.2.2.2.Test Limit

According to standard EN IEC 55014-1, if click rate (N) less 5/min and the time of this discontinuous disturbances does not exceed 10ms, then the limit value are omitted.

4.2.3.EUT Configuration on Test

The configuration of EUT is same as Section 4.2.1.

4.2.4.Operating Condition of EUT

4.2.4.1.Setup the EUT as shown Section 4.2.1.

4.2.4.2.Turn on the power of all equipments.

4.2.4.3.After that, let EUT work in test Mode 1 and measure it.

4.2.5.Test Procedure

This test is done when switch operations in Megalifetatically controlled appliances, automatic program controlled machines and other electrically controlled or operated appliances may generate discontinuous disturbance (Click). The measurement of disturbance shall be performed at the following restricted number of frequencies: 150kHz, 500kHz, 1.4MHz and 30MHz. At each frequency, for appliances which stop automatically, duration of the minimum number of complete programs necessary to produce 40 counted clicks or, where relevant, 40 counted clicks have not been produced, the test is stopped at the end of the program in course. The relevant click rate N. The appliance under test shall be deemed to comply with the limit if not more than a quarter of the number of the counted click registered during the observation time.

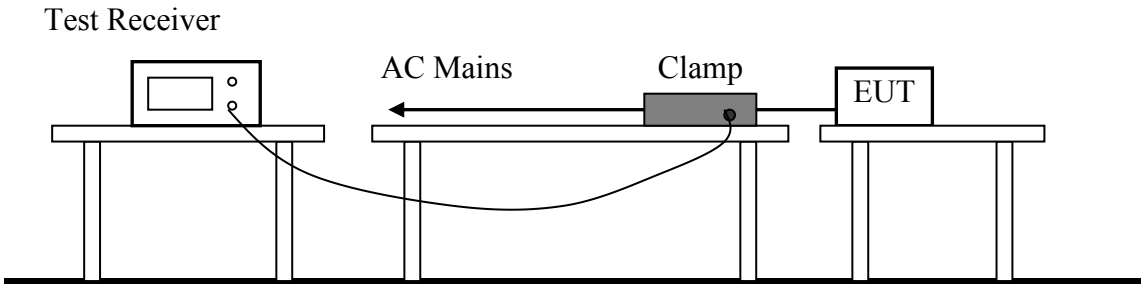
4.2.6.Test Results

PASS.

The click rate (N=1/2.1=0.48<5) of the EUT is less than 5/min and the time of this discontinuous disturbances (△T=4ms<10ms) does not exceed 10ms.According to EN IEC 55014-1, the limit values are omitted.

4.3. Disturbance Power Measurement

4.3.1.Block Diagram of Test Setup



4.3.2.Test Standard

EN IEC 55014-1: 2021

4.3.3.Disturbance Power Limits

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

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

	Household and similar appliances		Tools					
1	2	3	4	5	6	7	8	9
Frequency range			Rated motor power not exceeding 700 W		Rated motor power above 700 W and not exceeding 1000 W		Rated motor power above 1000 W	
(MHz)	dB (pW) Quasi-peak	dB (pW) Average	dB (pW) Quasi-peak	dB (pW) Average	dB (pW) Quasi-peak	dB (pW) Average	dB (pW) Quasi-peak	dB (pW) Average
Increasing linearly with the frequency from:								
200 to 300	0 to 10 dB	-	0 to 10 dB	-	0 to 10 dB	-	0 to 10 dB	-
NOTE 1 This table only applies if specified in 4.1.2.3.2. NOTE 2 The measured result at a particular frequency shall be less than the relevant limit minus the corresponding margin (at that frequency).								

4.3.4.EUT Configuration on Test

The EN IEC 55014-1 Regulations test method must be used to find the maximum emission during radiated emission measurement. The configuration of the EUT is

the same as used in conducted emission measurement.

4.3.5.Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 4.1.1 except the test set up replaced as Section 4.3.1.

4.3.6.Test Procedure

The EUT is placed on the plane 0.8m high above the ground by insulating support and away from other metallic surface at least 0.4m. 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.

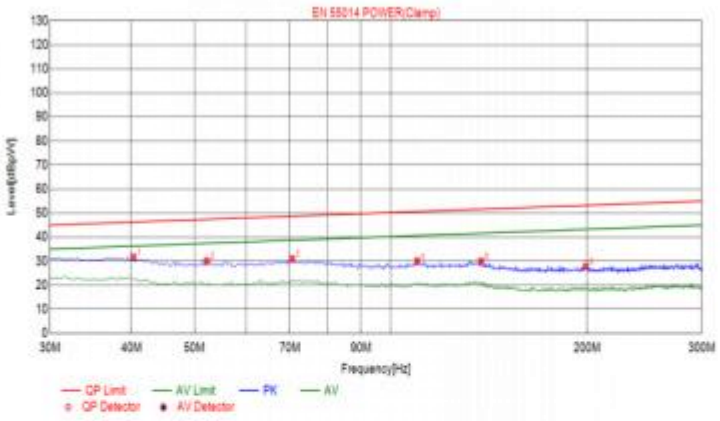
The bandwidth of the field strength meter is set at 120kHz.
All the test results are listed in Section 4.3.7.

4.3.7.Test Results

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

Test Model	NFSJ300VLA10	**Test Mode**	Mode 1
Pol	AC	**Test Engineer**	Andy

Test Graph

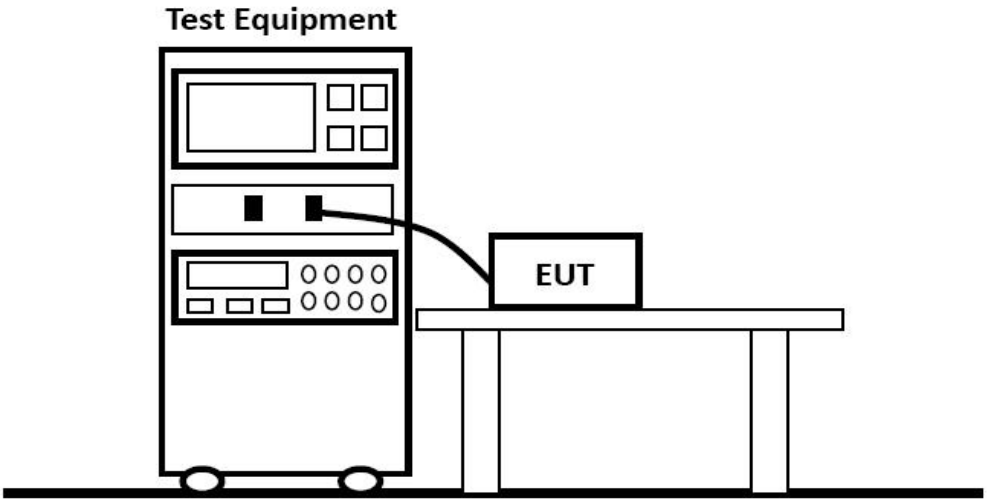


Suspected List

NO.	Freq. [MHz]	Level[dBµV]	Factor [dB]	Reading [dBµV]	Limit [dBµV]	Margin [dB]	Detector	Type
1	40.2703	31.65	7.68	23.97	46.28	14.63	PK	Clamp
2	52.1622	30.00	5.58	24.42	47.40	17.40	PK	Clamp
3	70.5405	31.00	6.72	24.28	48.71	17.71	PK	Clamp
4	109.7297	29.93	5.66	24.27	50.63	20.70	PK	Clamp
5	137.5676	29.90	5.21	24.69	51.61	21.71	PK	Clamp
6	199.1892	27.88	3.08	24.80	53.22	25.34	PK	Clamp

4.4. Harmonic Current Emission Measurement

4.4.1.Block Diagram of Test Setup



4.4.2.Test Standard

EN IEC 61000-3-2: 2019+A1: 2021+A2: 2024, Class A

4.4.3.Operation Condition of EUT

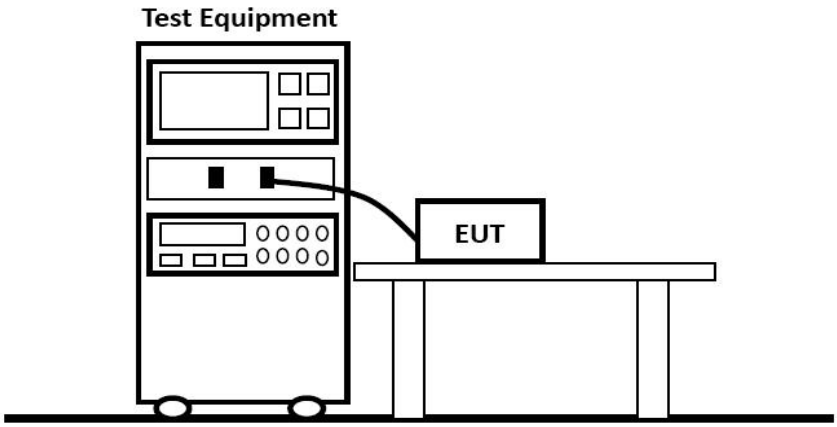
Same as Section 4.1.4 except the test setup replaced as Section 4.4.1.

4.4.4.Test Results

PASS

4.5. Voltage Fluctuation And Flicker Measurement

4.5.1.Block Diagram of Test Setup



4.5.2.Test Standard

EN 61000-3-3: 2013+A1: 2019+A2: 2021+AC: 2022

4.5.3.Operation Condition of EUT

4.5.3.1.Setup the EUT as shown Section 4.5.1.

4.5.3.2.Turn on the power of all equipments.

4.5.3.3.Let EUT work in test mode (On/Off) and measure it.

4.5.4.Test Results

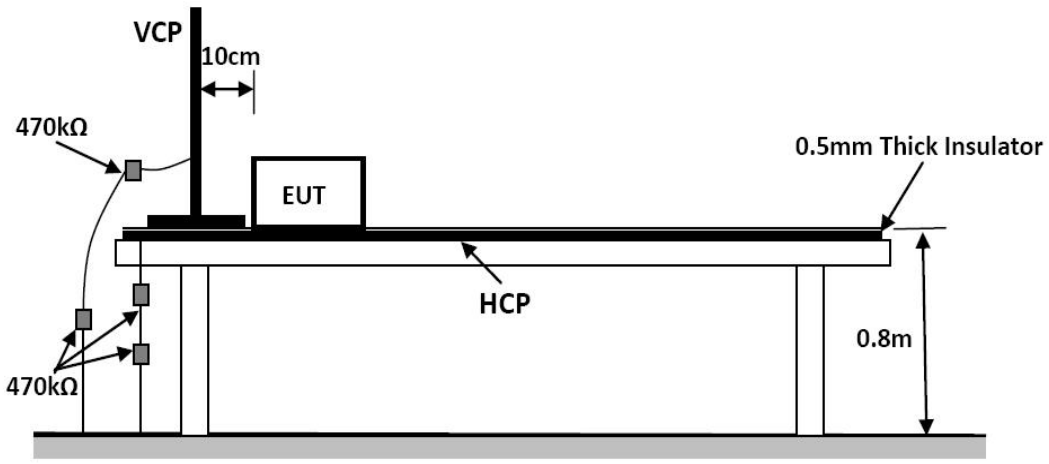
PASS.

Test Model	NFSJ300VLA10	**Test Engineer**	Andy
Overall Result: **PASS**	Notes: Measurement method - Voltage		

	Pst	dc (%)	dmax (%)	d(t) > 3.3%(ms)
Limit	1.000	3.300	4.000	500
Reading 1	0.089	0.009	0.137	0

4.6. Electrostatic Discharge Immunity Test

4.6.1.Block Diagram of Test Setup



4.6.2.Test Standard

EN IEC 55014-2: 2021(EN 61000-4-2: 2009, Severity Level: 3 / Air Discharge: ±8KV; Level: 2 / Contact Discharge: ±4KV)

4.6.3.Severity Levels and Performance Criterion

4.6.3.1.Severity level

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

4.6.3.2.Performance criterion: **B**

4.6.4.EUT Configuration on Test

The configuration of EUT are listed in Section 4.6.1.

4.6.5.Operating Condition of EUT

Same as conducted emission measurement, which is listed in Section 4.1.4, except the test set up replaced by Section 4.6.1.

4.6.6.Test Procedure

4.6.6.1.Air Discharge

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

4.6.6.2.Contact Discharge

All the procedure shall be same as Section 4.6.6.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

4.6.6.3.Indirect Discharge For Horizontal Coupling Plane

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

4.6.6.4.Indirect Discharge For Vertical Coupling Plane

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

4.6.7.Test Results

PASS.

Please refer to the next page.

Electrostatic Discharge Test Results

Standard	☐ IEC 61000-4-2 ☑ EN 61000-4-2		
Applicant	Guangdong Well-born Electric Appliance Co., Ltd.		
EUT	Electric Water Heater	**Temperature**	25℃
M/N	NFSJ300VLA10	**Humidity**	50%
Criterion	B	**Pressure**	1021mbar
Test Mode	Mode 1	**Test Engineer**	Andy

Air Discharge

Test Points	Test Levels			Results		
	± 2kV	± 4kV	± 8kV	Passed	Fail	Performance Criterion
Front	☒	☒	☒	☒	☐	☐A ☒B
Back	☒	☒	☒	☒	☐	☐A ☒B
Left	☒	☒	☒	☒	☐	☐A ☒B
Right	☒	☒	☒	☒	☐	☐A ☒B
Top	☒	☒	☒	☒	☐	☐A ☒B
Bottom	☒	☒	☒	☒	☐	☐A ☒B

Contact Discharge

Test Points	Test Levels		Results		
	± 2 kV	±4 kV	Passed	Fail	Performance Criterion
Front	☒	☒	☒	☐	☐A ☒B
Back	☒	☒	☒	☐	☐A ☒B
Left	☒	☒	☒	☐	☐A ☒B
Right	☒	☒	☒	☐	☐A ☒B
Top	☒	☒	☒	☐	☐A ☒B
Bottom	☒	☒	☒	☐	☐A ☒B

Discharge To Horizontal Coupling Plane

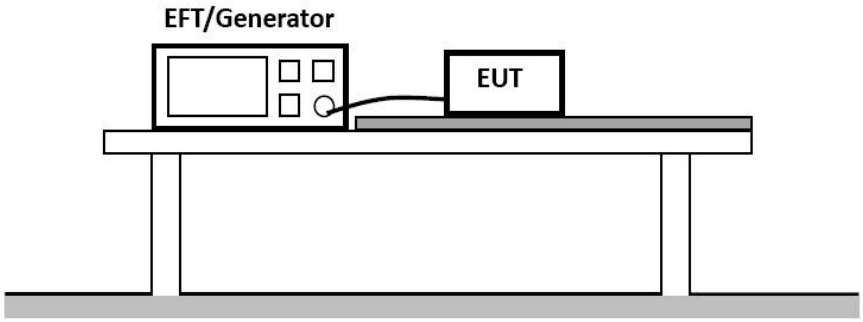
Side of EUT	Test Levels		Results		
	± 2 kV	± 4 kV	Passed	Fail	Performance Criterion
Front	☒	☒	☒	☐	☐A ☒B
Back	☒	☒	☒	☐	☐A ☒B
Left	☒	☒	☒	☐	☐A ☒B
Right	☒	☒	☒	☐	☐A ☒B

Discharge To Vertical Coupling Plane

Side of EUT	Test Levels		Results		
	± 2 kV	± 4 kV	Passed	Fail	Performance Criterion
Front	☒	☒	☒	☐	☐A ☒B
Back	☒	☒	☒	☐	☐A ☒B
Left	☒	☒	☒	☐	☐A ☒B
Right	☒	☒	☒	☐	☐A ☒B

4.7. Electrical Fast Transient/Burst Immunity Test

4.7.1.Block Diagram of Test Setup



4.7.2.Test Standard

EN IEC 55014-2: 2021 (EN 61000-4-4: 2012, Severity Level: Level 2: 1KV)

4.7.3.Severity Levels and Performance Criterion

4.7.3.1.Severity level

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

4.7.3.2.Performance criterion: **B**

4.7.4.EUT Configuration on Test

The configuration of EUT are listed in Section 4.7.1.

4.7.5.Operating Condition of EUT

4.7.5.1.Setup the EUT as shown in Section 4.7.1.

4.7.5.2.Turn on the power of all equipments.

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

4.7.6.Test Procedure

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

4.7.6.1.For input and output AC power ports:

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

4.7.6.2.For signal lines and control lines ports:

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

4.7.6.3.For DC output line ports:

No DC output ports. It's unnecessary to test.

4.7.7.Test Results

PASS.

Please refer to the following page.

Electrical Fast Transient/Burst Test Results

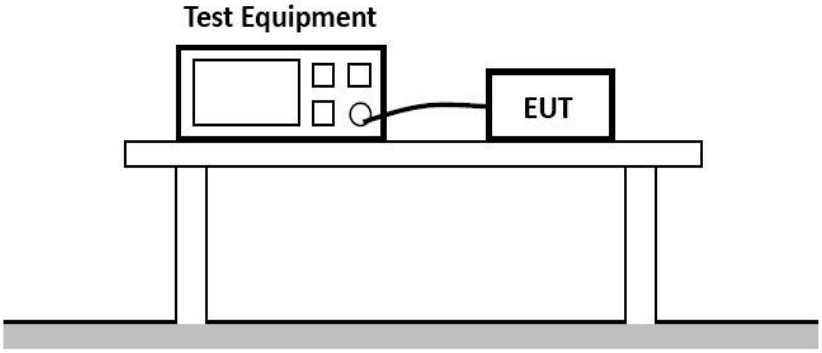
Standard	☐ IEC 61000-4-4 ☑ EN 61000-4-4		
Applicant	Guangdong Well-born Electric Appliance Co., Ltd.		
EUT	Electric Water Heater	**Temperature**	25℃
M/N	NFSJ300VLA10	**Humidity**	50%
Test Mode	Mode 1	**Criterion**	B
Test Engineer	Andy		

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

Note:

4.8. Surge Immunity Test

4.8.1.Block Diagram of Test Setup



4.8.2.Test Standard

EN IEC 55014-2: 2021

(EN 61000-4-5: 2014+A1：2017, Severity Level: Level 2, Line to Line: 1.0KV; Level 3: Line to Ground: 2.0KV)

4.8.3.Severity Levels and Performance Criterion

4.8.3.1.Severity level

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

4.8.3.2.Performance criterion: **B**

4.8.4.EUT Configuration on Test

The configuration of EUT are listed in Section 4.8.1.

4.8.5.Operating Condition of EUT

4.8.5.1.Setup the EUT as shown in Section 4.8.1.

4.8.5.2.Turn on the power of all equipments.

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

4.8.6.Test Procedure

4.8.6.1.Set up the EUT and test generator as shown on Section 4.8.1.

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

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

4.8.6.4.Different phase angles are done individually.

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

4.8.7.Test Results

PASS.

Please refer to the following pages

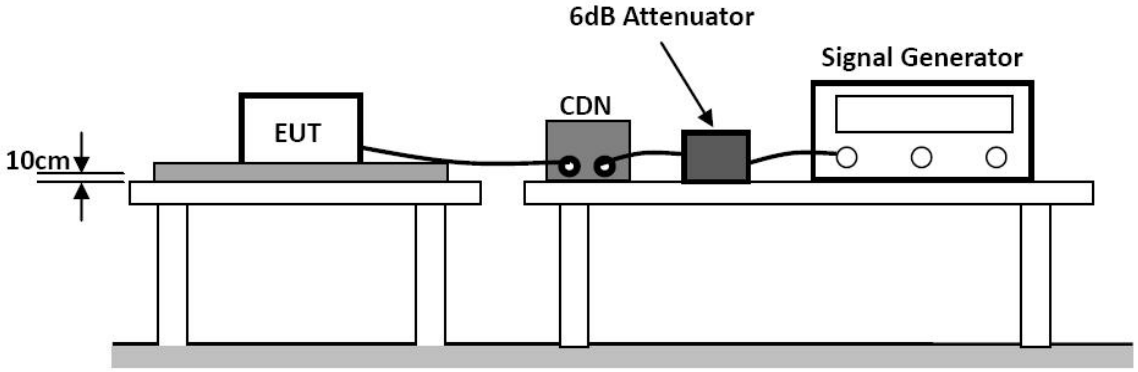
Surge Immunity Test Result

Standard	☐ IEC 61000-4-5 ☑ EN 61000-4-5		
Applicant	Guangdong Well-born Electric Appliance Co., Ltd.		
EUT	Electric Water Heater	**Temperature**	25℃
M/N	NFSJ300VLA10	**Humidity**	50%
Test Mode	Mode 1	**Criterion**	B
Test Engineer	Andy		

Location	Polarity	Phase Angle	Number of Pulse	Pulse Voltage (KV)	Result
L-N	+	90°	5	1.0	PASS
	-	270°	5	1.0	PASS
L-PE					
N-PE					
Signal Line					
Note					

4.9. Injected Currents Susceptibility Test

4.9.1.Block Diagram of Test Setup



4.9.2.Test Standard

EN IEC 55014-2: 2021(EN 61000-4-6: 2014, Severity Level: 3V (rms), (0.15MHz ~ 230MHz))

4.9.3.Severity Levels and Performance Criterion

4.9.3.1.Severity level

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

4.9.3.2.Performance criterion: **A**

4.9.4.EUT Configuration on Test

The configuration of EUT are listed in Section 4.9.1.

4.9.5.Operating Condition of EUT

4.9.5.1.Setup the EUT as shown in Section 4.9.1.

4.9.5.2.Turn on the power of all equipments.

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

4.9.6.Test Procedure

4.9.6.1.Set up the EUT, CDN and test generators as shown on Section 4.9.1.

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

4.9.6.3.The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).

4.9.6.4.The disturbance signal described below is injected to EUT through CDN.

4.9.6.5.The EUT operates within its operational mode(s) under intended climatic conditions after power on.

4.9.6.6.The frequency range is swept from 150kHz to 230MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1kHz sine wave.

4.9.6.7.The rate of sweep shall not exceed 1.5*10-3 decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.

4.9.6.8.Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

4.9.7.Test Results

PASS.

Please refer to the following pages

Injected Currents Susceptibility Test Results

Standard	☐ IEC 61000-4-6 ☑ EN 61000-4-6		
Applicant	Guangdong Well-born Electric Appliance Co., Ltd.		
EUT	Electric Water Heater	**Temperature**	25℃
M/N	NFSJ300VLA10	**Humidity**	50%
Test Mode	Mode 1	**Criterion**	A
Test Engineer	Andy		

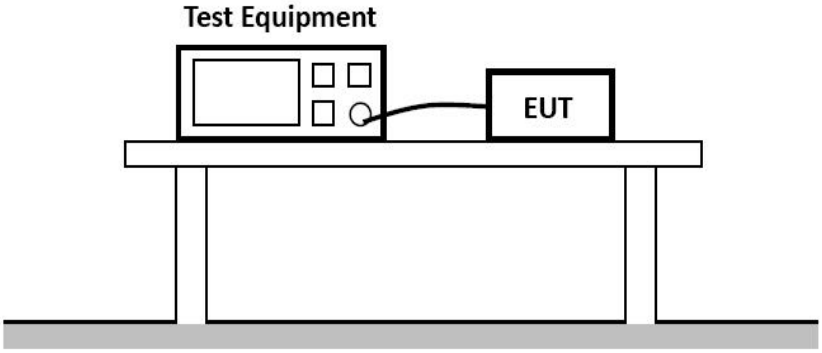
Frequency Range (MHz)	Injected Position	Strength (Unmodulated)	Criterion	Result
0.15 ~ 230	AC Mains	3V	A	PASS

Remark:
1. Modulation Signal:1kHz 80% AM
2. Measurement Equipment :
Simulator: CIT-10 (FRANKONIA)
CDN : ☑CDN-M2 (SWITZERLAND EMTEST)
☐CDN-M3 (SWITZERLAND EMTEST)

Note:

4.10. Voltage Dips And Interruptions Test

4.10.1.Block Diagram of Test Setup



4.10.2.Test Standard

EN IEC 55014-2: 2021 (EN 61000-4-11: 2020)

4.10.3.Severity Levels and Performance Criterion

4.10.3.1.Severity level

Test Level (%U_T)	Voltage dip and short interruptions (%U_T)	Duration (in period)	
0	100	0.5	0.6
40	60	10	12
70	30	25	60

4.10.3.2.Performance criterion: **C&C**

4.10.4.EUT Configuration on Test

The configuration of EUT are listed in Section 4.10.1.

4.10.5.Operating Condition of EUT

4.10.5.1.Setup the EUT as shown in Section 4.10.1.

4.10.5.2.Turn on the power of all equipments.

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

4.10.6.Test Procedure

4.10.6.1.Set up the EUT and test generator as shown on Section 4.10.1.

4.10.6.2.The interruptions is introduced at selected phase angles with specified duration.

4.10.6.3.Record any degradation of performance.

4.10.7.Test Results

PASS.

Please refer to the following page.

Voltage Dips And Interruptions Test Results

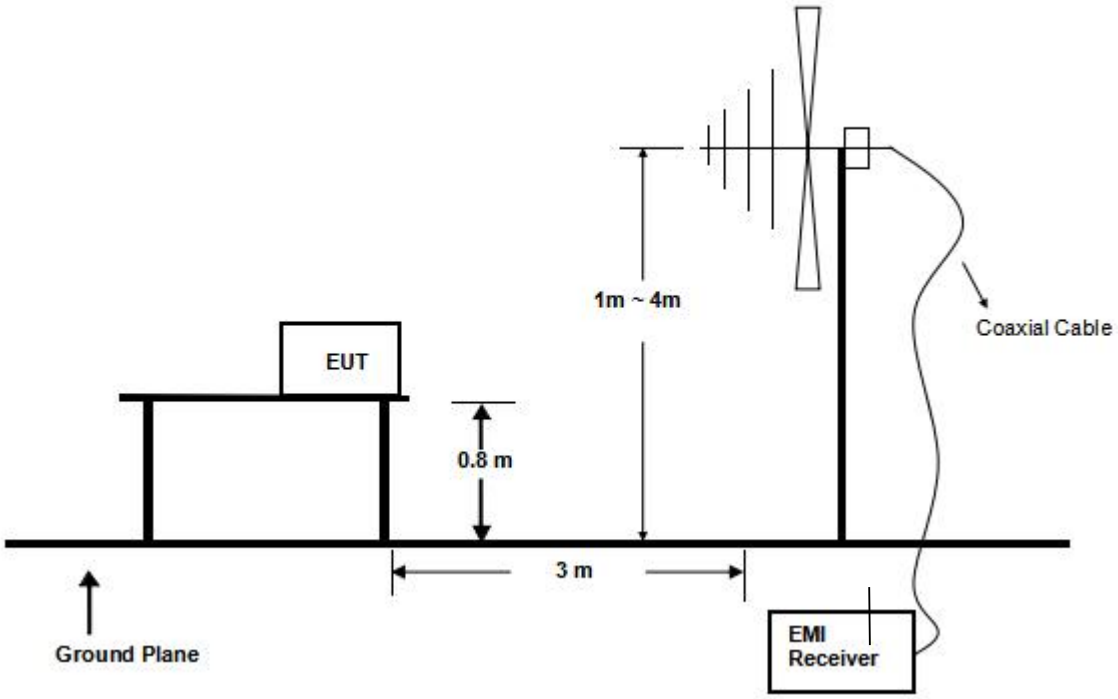
Standard	☐ IEC 61000-4-11 ☑ EN 61000-4-11		
Applicant	Guangdong Well-born Electric Appliance Co., Ltd.		
EUT	Electric Water Heater	**Temperature**	25℃
M/N	NFSJ300VLA10	**Humidity**	50%
Test Mode	Mode 1	**Criterion**	C&C
Test Engineer	Andy		

Test Level % U_T	**Voltage Dips & Short Interruptions % U_T**	**Duration (in periods)**		**Criterion**	**Result**
		50Hz	**60Hz**		
40	60	10P	12P	C	PASS
70	30	25P	60P	C	PASS
0	100	0.5P	0.6P	C	PASS

Note:

5. RADIATED EMISSION MEASUREMENT

5.1.Block Diagram of Test Setup



5.2.Measuring Standard
EN IEC 55014-1:2017+A11:2020

5.3.Radiated Emission Limits
EN 55032: 2015 Limits:
All emanations from a class B device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified below:

FREQUENCY (MHz)	DISTANCE (Meters)	FIELD STRENGTHS LIMIT (dBμV/m)
30 ~ 230	3	40
230 ~ 1000	3	47

Note:
1.The smaller limit shall apply at the combination point between two frequency bands.

2.Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

5.4.EUT Configuration on Test

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

5.5.Operating Condition of EUT

4.5.1 Turn on the power.

4.5.2 After that, let the EUT work in test mode (ON) and measure it.

5.6.Test Procedure

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

The bandwidth of the Receiver is set at 120kHz.

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

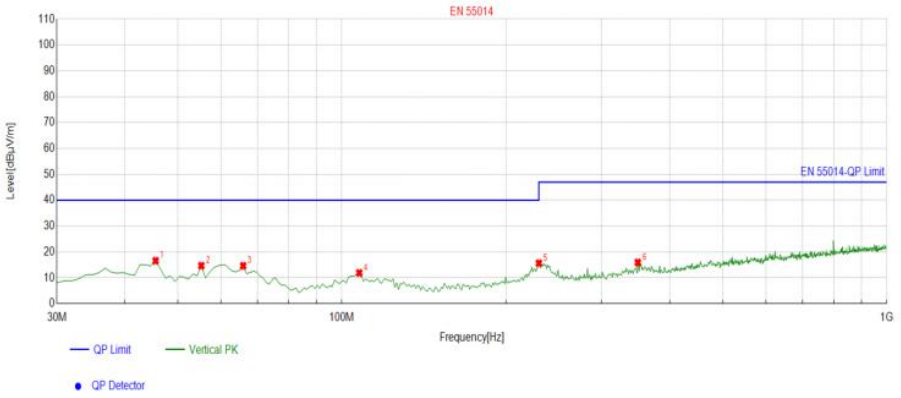
5.7.Test Results

PASS.

The test result please refer to the next page.

Model No.	NFSJ300VLA10	Test Date	May 15, 2025
Environmental Conditions	24℃/ 56% RH	Test Mode	On
Pol	Vertical	Detector Function	Quasi-peak
Test Engineer	Andy	Distance	3m

Test Graph

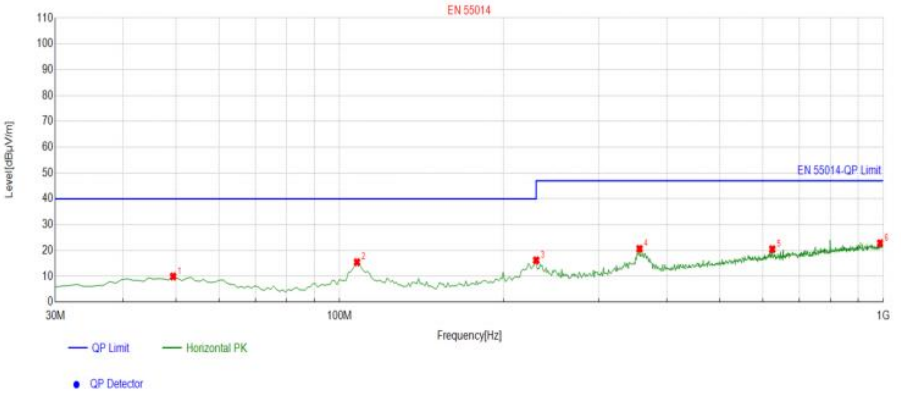


Suspected List

Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	45.5355	-13.65	30.25	16.60	40.00	23.40	100	27	Vertical
2	55.2452	-14.44	29.11	14.67	40.00	25.33	100	309	Vertical
3	65.9259	-16.65	31.26	14.61	40.00	25.39	100	357	Vertical
4	107.6777	-15.42	27.30	11.88	40.00	28.12	100	199	Vertical
5	230.0200	-14.32	29.95	15.63	47.00	31.37	100	46	Vertical
6	349.4494	-11.69	27.60	15.91	47.00	31.09	100	78	Vertical

Model No.	NFSJ300VLA10	Test Date	May 15, 2025
Environmental Conditions	24℃/ 56% RH	Test Mode	Charging
Pol	Horizontal	Detector Function	Quasi-peak
Test Engineer	Andy	Distance	3m

Test Graph



Suspected List

Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	49.4194	-13.65	23.59	9.94	40.00	30.06	100	46	Horizontal
2	107.6777	-15.42	30.87	15.45	40.00	24.55	100	13	Horizontal
3	230.0200	-14.32	30.50	16.18	47.00	30.82	100	1	Horizontal
4	356.2462	-11.47	32.13	20.66	47.00	26.34	100	96	Horizontal
5	625.2052	-5.50	26.00	20.50	47.00	26.50	100	180	Horizontal
6	987.3774	-1.06	23.91	22.85	47.00	24.15	100	296	Horizontal

6. EXTERNAL AND INTERNAL PHOTOS OF THE EUT

Fig.1

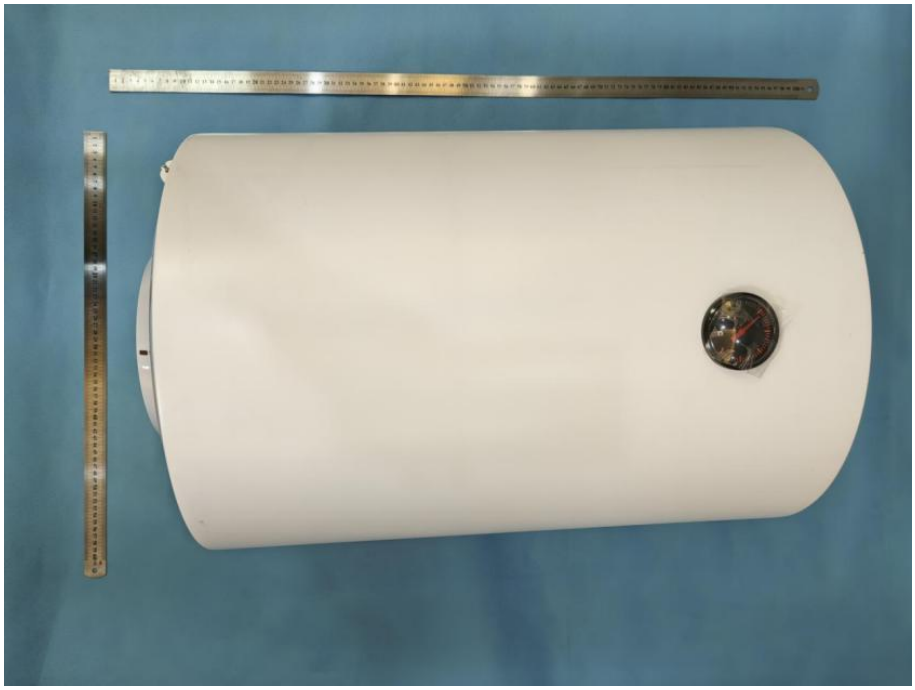


Fig.2

Fig.3

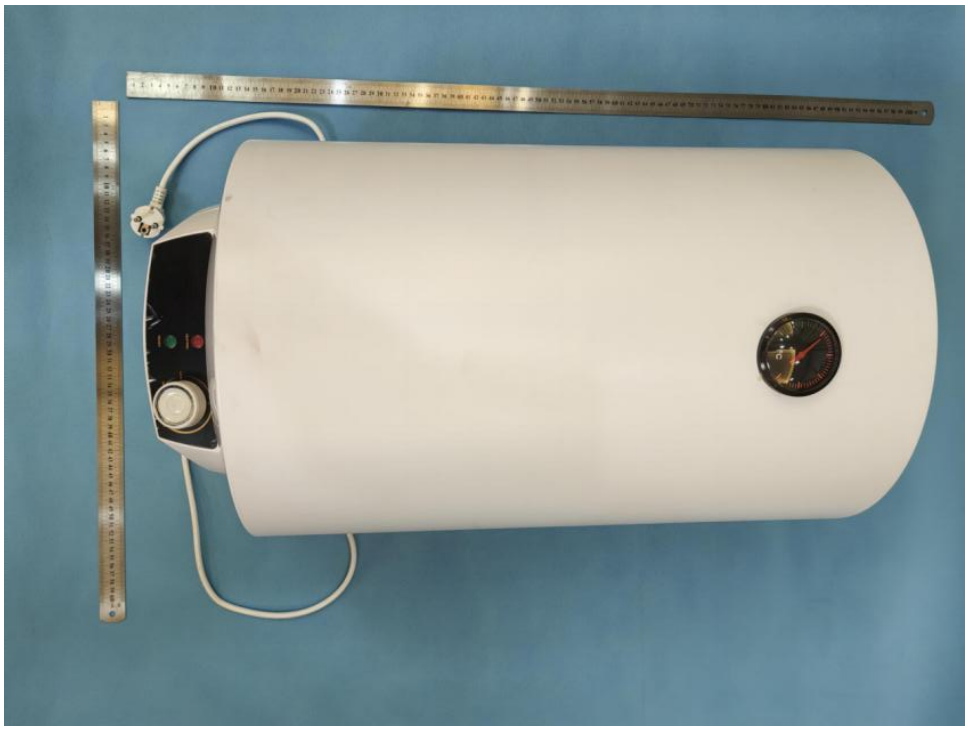


Fig.4

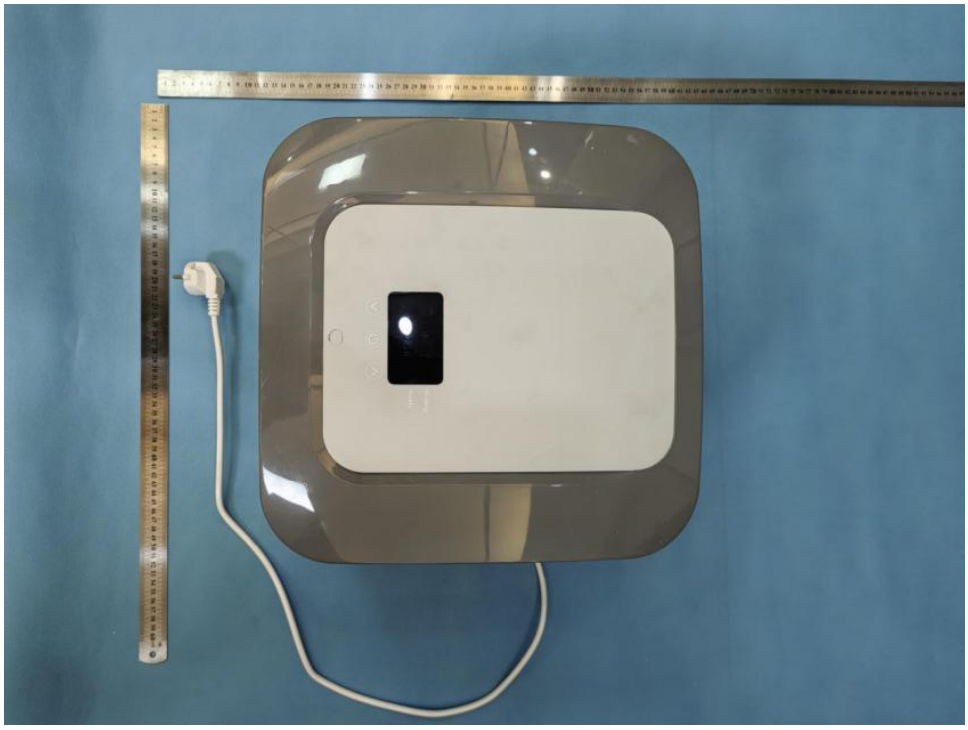


Fig.5

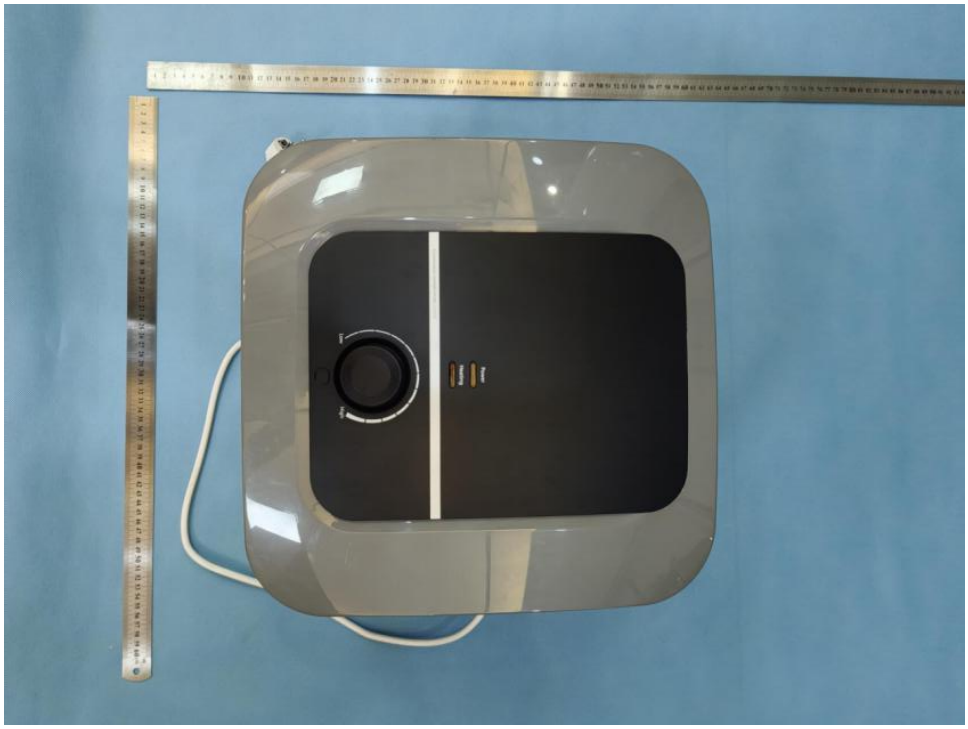


Fig.6

Fig.7

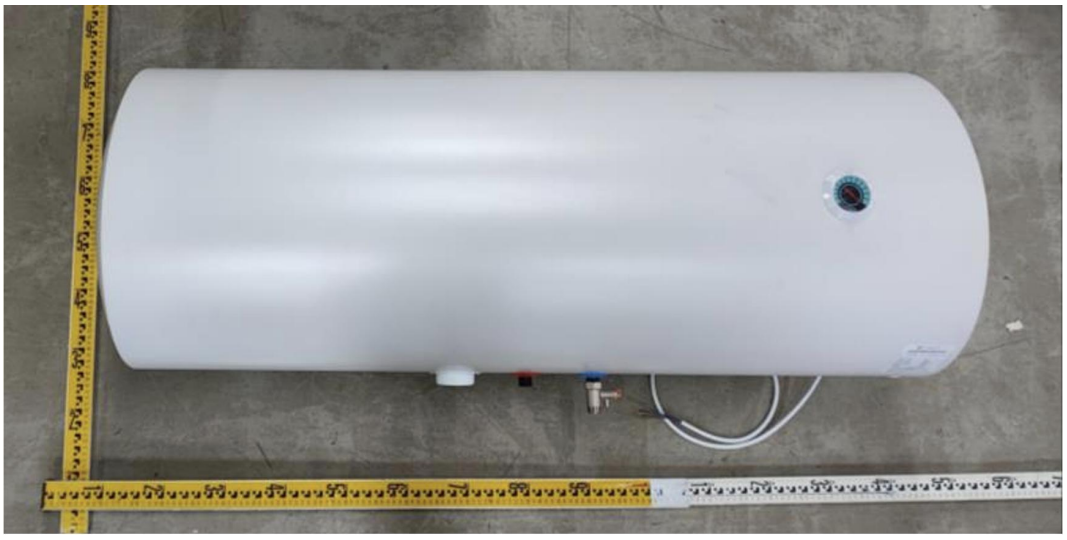


Fig.8

Fig.9

Fig.10

Model List

NRJ50VLA12	NRJ80VLA12	NRJ100VLA12	NRJ150VLA12
NRJ50VLA11	NRJ80VLA11	NRJ100VLA11	NRJ150VLA11
NRJ50VLA10	NRJ80VLA10	NRJ100VLA10	NRJ150VLA10
NRJ30VLA10	NRJ30VLA11	NRJ30VLA12	NSJ10VLA8M
NSJ15VLA8M	NSJ30VLA8M	NSJ10VLA8D	NSJ15VLA8D
NSJ30VLA8D	NFSJ150VLA10	NFSJ200VLA10	NFSJ300VLA10
NRJ30VLA14	NRJ50VLA14	NRJ80VLA14	NRJ100VLA14
NRJ30VLA15-2	NRJ50VLA15-2	NRJ80VLA15-2	NRJ100VLA15-2
NSJ10VLA8UM	NSJ15VLA8UM	NSJ30VLA8UM	NSJ10VLA8UD
NSJ15VLA8UD	NSJ30VLA8UD	NRJ30VLA10H	NRJ50VLA10H
NRJ80VLA10H	NRJ100VLA10H	NRJ30VLA11H	NRJ50VLA11H
NRJ80VLA11H	NRJ100VLA11H		

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