

ZHONGSHAN GENTECH ELECTRIC APPLIANCE CO.,LTD.

TEST REPORT

SCOPE OF WORK

EMC TESTING– REFER TO PAGE 2

REPORT NUMBER

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TEST REPORT

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Manufacturing Site : Same as applicant

Intertek Report No: 180319050GZU-001

Test standards

EN 55014-1:2017
EN 61000-3-2:2014
EN 61000-3-3:2013
EN 55014-2:2015

Sample Description

Product : ELECTRIC OVEN

Model No. : JK09C-01,JK16C01, JK16C01-* JK19C01, JK19C01-*, JK25C01,
JK25C01-*, JK25C02, JK25C02-*, JK30C01, JK30C01-*, JK30C02,
JK30C02-*, JK38C01, JK38C01-*, JK38C02, JK38C02-*, JK48C01,
JK48C01-*,JK48C02, JK48C02-*, JK60C01, JK60C01-*, JK60C02,
JK60C02-* (*=R or M or RM or L or RL or ML or RML)

Electrical Rating : See page 6

Serial No. : Not Labeled

Date Received : 20 March 2018

Date Test : 20 March 2018 - 30 March 2018

Conducted

Prepared and Checked By


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TEST REPORT

1. TEST RESULTS SUMMARY

Test Item	Standard	Result
Continuous conducted disturbance voltage	EN 55014-1:2017	Pass
Conducted Disturbance at wired network ports	EN 55014-1:2017	N/A
Discontinuous conducted disturbance voltage	EN 55014-1:2017	Pass
Radiated disturbance(9kHz-30MHz)	EN 55014-1:2017	N/A
Radiated disturbance power	EN 55014-1:2017	Pass
Radiated disturbance(30MHz-1000MHz)	EN 55014-1:2017	N/A
Harmonic of current	EN 61000-3-2:2014	Pass
Flicker	EN 61000-3-3:2013	Pass
ESD immunity	EN 55014-2: 2015 Reference: EN 61000-4-2:2009	N/A
Radiated EM field immunity	EN 55014-2:2015 Reference: EN 61000-4-3:2006 +A1:2008+A2:2010	N/A
EFT immunity	EN 55014-2:2015 Reference: EN 61000-4-4:2012	N/A
Surge immunity	EN 55014-2:2015 Reference: EN 61000-4-5:2014	N/A
Inject current immunity	EN 55014-2:2015 Reference: EN 61000-4-6:2014	N/A
Voltage dips and interruption immunity	EN 55014-2:2015 Reference: EN 61000-4-11: 2004	N/A

Remark:

1. The symbol "N/A" in above table means Not Applicable.
2. When determining the test results, measurement uncertainty of tests has been considered.

TEST REPORT**2. EMC RESULTS CONCLUSION**

RE: EMC Testing Pursuant to EMC Directive 2014/30/EU Performed on the ELECTRIC OVEN, Models: JK09C-01, JK16C01, JK16C01-* JK19C01, JK19C01-*, JK25C01, JK25C01-*, JK25C02, JK25C02-*, JK30C01, JK30C01-*, JK30C02, JK30C02-*, JK38C01, JK38C01-*, JK38C02, JK38C02-*, JK48C01, JK48C01-*, JK48C02, JK48C02-*, JK60C01, JK60C01-*, JK60C02, JK60C02-* (*=R or M or RM or L or RL or ML or RML).

Ratings:

220-240 V~, 50-60 Hz, Class I

650W (for JK09C-01);

1280 W (for JK16C01, JK16C01-*, JK19C01, JK19C01-*);

1600 W for JK25C01, JK25C01-*, JK25C02, JK25C02-*, JK30C01, JK30C01-*, JK30C02, JK30C02-*, JK38C01, JK38C01-*, JK38C02, JK38C02-*);

2000 W (for JK48C01, JK48C01-*, JK48C02, JK48C02-*, JK60C01, JK60C01-*, JK60C02, JK60C02-*)

Model differences:

All models are identical except for the following differences:

1. Model JK16C01, JK19C01, JK25C01, JK25C02, JK30C01, JK30C02, JK38C01, JK38C02, JK48C01, JK48C02, JK60C01 and JK60C02 have no rotary motor, fan motor and lamp, which are identical except the size and power input;
2. JK16C01, JK16C01-* JK19C01, JK19C01-*, JK25C01, JK25C01-*, JK30C01, JK30C01-*, JK38C01, JK38C01-*, JK48C01, JK48C01-*, JK60C01 and JK60C01-* are identical except the size and power input;
3. Model JK25C02, JK25C02-*, JK30C02, JK30C02-*, JK38C02, JK38C02-*, JK48C02, JK48C02-*, JK60C02, JK60C02-* are identical except the size and power input;
4. Model JK09C-01 with the glass tubular heating element, other models with metal tubular sheathed heating element;
5. "09, 16, 19, 25, 30, 38, 48 or 60" means the product sizes;
6. "01" mean oven with 3 knobs on control panel;
7. "02" mean appliance with 4 knobs on control panel;
8. "R" means appliance with a rotary motor.
9. "M" means appliance includes a fan motor.
10. "L" means appliance includes a lamp.

Based on engineering judgement, full tests shall be performed on model JK60C02-RML.

We tested the ELECTRIC OVEN, Model: JK60C02-RML, to determine if it was in compliance with the relevant EN standards as marked on the Test Results Summary. We found that the unit met the requirements of EN 55014-1, EN 61000-3-2, EN 61000-3-3 standards when tested as received. The worst case's test data was presented in this test report.

TEST REPORT

The production units are required to conform to the initial sample as received when the units are placed on the market.

Standards against which no testing has been conducted of the captioned model and the engineering judgement is stated as follows:

EN55014-2: This product contains no electronic control circuitry. It is classified to Category I of the standard and is therefore deemed to fulfil the relevant immunity requirements without testing.

TEST REPORT

3. LABORATORY MEASUREMENTS

Configuration Information

Support Equipment:	N/A
Rated Voltage and frequency under test:	220-240 V~; 50 Hz
Condition of Environment:	Temperature: 22~28°C Relative Humidity:35~60% Atmosphere Pressure:86~106kPa

Notes:

1. The EMI measurements had been made in the operating mode produced the largest emission in the frequency band being investigated consistent with normal applications. An attempt had been made to maximize the emission by varying the configuration of the EUT.

2. Test Location:

Mechanical & Electrical Laboratory of Inspection & Quarantine Technology Center of
Guangdong Entry-Exit Inspection & Quarantine Bureau
No.3, Desheng East Road, Shunde Daliang, Foshan, Guangdong, China

TEST REPORT

4. EQUIPMENT USED DURING TEST

For Conducted Disturbance Test

NO.	Model No.	Manufacturer	Equipment	Serial No.	Cal. due date
200744CP0002-1	SMR4503	SCHAFFNER	EMI receiver	47	2018.08.13
201044CK0121	ESH2-Z5	Rohde & Schwarz	LISN	3385219.53-100298-HS	2018.08.13
1244BK0003SD	PLA-10N	Compliance Direction Systems Inc.	10dB Pulse Limiter	110525-010-0030	2018.08.13
201044CK0128-1	NP-HJ2	Changzhou Nanping	shielding room	1#	2019.01.03

For Disturbance Power Test

NO.	Model No.	Manufacturer	Equipment	Serial No.	Cal. due date
200744CP0002-1	SMR4503	SCHAFFNER	EMI receiver	47	2018.08.13
201144CK0065	MDS-21	R&S	Power absorbing Clamp	100443	2019.01.03
201044CK0128-1	NP-HJ2	Changzhou Nanping	shielding room	1#	2019.01.03

For Click Test

NO.	Model No.	Manufacturer	Equipment	Serial No.	Cal. due date
200844CK0062	PM 9010	PMM	EMI receiver	153WJ80401	2018.08.13
200844CK0085	PM 9010 CLICK 4E	PMM	Click analyser	000WE80803	2018.08.13
201044CK0123	L3-32	PMM	LISN	1220X30403	2019.01.03
201044CK0128-1	NP-HJ2	Changzhou Nanping	shielding room	1#	2019.01.03

For Harmonic Test, For Flicker Test

NO.	Model No.	Manufacturer	Equipment	Serial No.	Cal. due date
201044CK0067	15003iX	California Instruments	Programmable ac source	59862/59863/59864	2018.08.13
201044CK0068	PACS-3	California Instruments	Harmonic and flicker analyzer	72812	2018.08.13

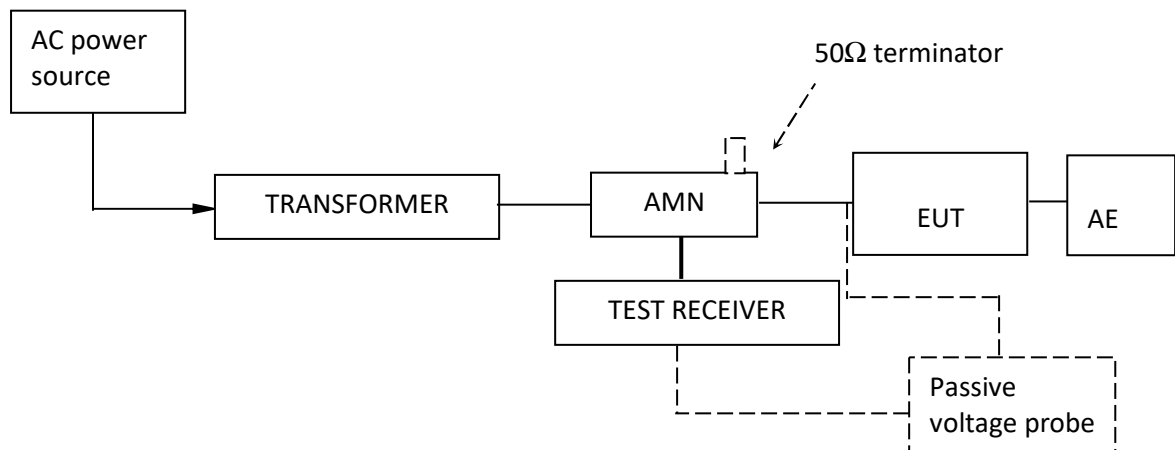
TEST REPORT

5. EMI TEST

5.1 EN 55014-1 Continuous Conducted Disturbance Voltage Test

Test Result: Pass

5.1.1 Block Diagram of Test Setup



5.1.2 Test Setup and Procedure

The EUT was set to achieve the maximum emission level. The mains terminal disturbance voltage was measured with the EUT in a shielded room. The EUT was connected to AC power source through an Artificial Mains Network which provides a 50Ω linear impedance Artificial hand is used if appropriate (for handheld apparatus). The load/control terminal disturbance voltage was measured with passive voltage probe if appropriate.

The table-top EUT was placed on a 0.4m high non-metallic table above earthed ground plane(Ground Reference Plane).And for floor standing EUT, was placed on a 0.1m high non-metallic supported on GRP. The EUT keeps a distance of at least 0.8m from any other of the metallic surface. The Artificial Mains Network is situated at a distance of 0.8m from the EUT.

During the test, mains lead of EUT excess 0.8m was folded back and forth parallel to the lead so as to form a horizontal bundle with a length between 0.3m and 0.4m.

The bandwidth of test receiver was set at 9 kHz. The frequency range from 150 kHz to 30MHz was checked.

When measurements of disturbance are being made, the appliance shall be operated under the conditions defined in Annex A.

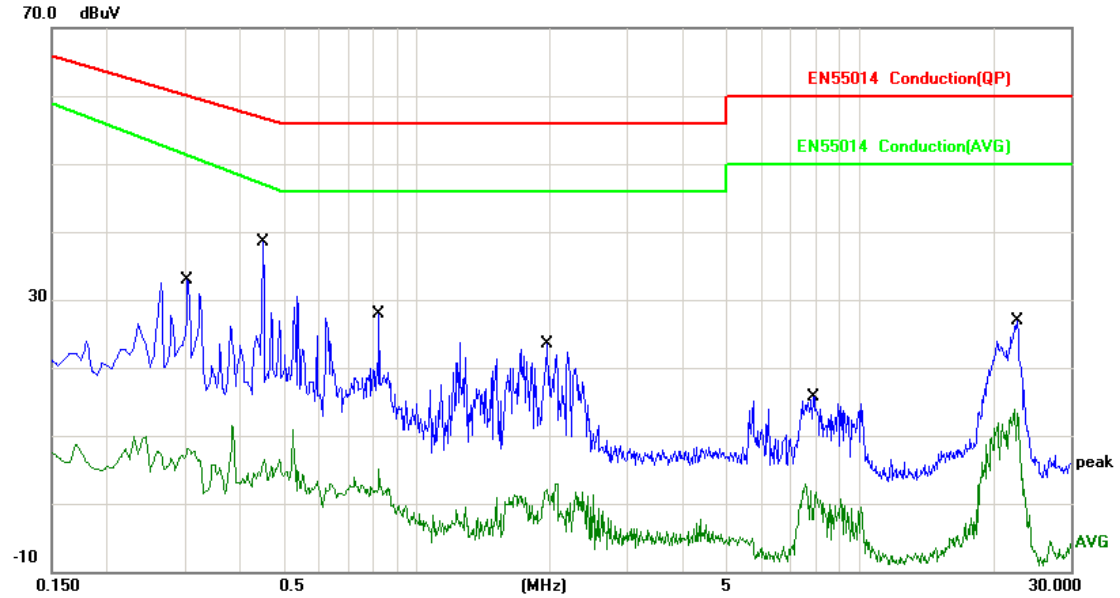
TEST REPORT

5.1.3 Test Data and curve

At mains terminal:

Tested Wire: Live

Operation Mode: all function on



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.3050	9.90	15.40	25.30	60.10	-34.80	QP	P
2	0.3050	9.90	-9.80	0.10	51.33	-51.23	AVG	P
3	0.4500	9.98	13.50	23.48	56.87	-33.39	QP	P
4	0.4500	9.98	1.80	11.78	47.14	-35.36	AVG	P
5	0.8250	10.12	11.40	21.52	56.00	-34.48	QP	P
6	0.8250	10.12	-5.40	4.72	46.00	-41.28	AVG	P
7	1.9700	10.18	7.80	17.98	56.00	-38.02	QP	P
8	1.9700	10.18	-6.80	3.38	46.00	-42.62	AVG	P
9	7.8650	10.28	4.80	15.08	60.00	-44.92	QP	P
10	7.8650	10.28	-7.80	2.68	50.00	-47.32	AVG	P
11	22.6800	10.36	12.54	22.90	60.00	-37.10	QP	P
12	22.6800	10.36	4.54	14.90	50.00	-35.10	AVG	P

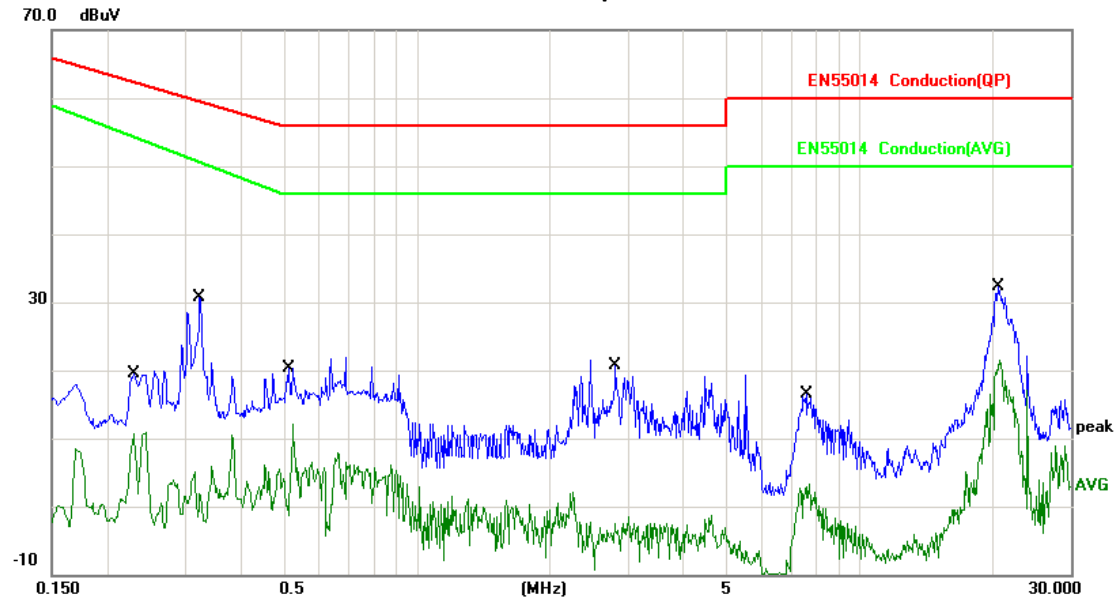
Remark:

1. Corr. (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Level (dBμV) = Corr. (dB) + Read Level (dBμV)
3. Delta Limit (dB) = Level (dBμV)-Limit (dBμV)

TEST REPORT

Tested Wire: Neutral

Operation Mode: all function on



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.2300	9.85	3.90	13.75	62.45	-48.70	QP	P
2	0.2300	9.85	-2.10	7.75	54.38	-46.63	AVG	P
3	0.3250	9.91	13.50	23.41	59.58	-36.17	QP	P
4	0.3250	9.91	1.60	11.51	50.65	-39.14	AVG	P
5	0.5150	10.02	11.60	21.62	56.00	-34.38	QP	P
6	0.5150	10.02	0.50	10.52	46.00	-35.48	AVG	P
7	2.8150	10.20	12.50	22.70	56.00	-33.30	QP	P
8	2.8150	10.20	-2.50	7.70	46.00	-38.30	AVG	P
9	7.5950	10.27	4.50	14.77	60.00	-45.23	QP	P
10	7.5950	10.27	-4.50	5.77	50.00	-44.23	AVG	P
11	20.5600	10.35	8.85	19.20	60.00	-40.80	QP	P
12	20.5600	10.35	0.15	10.50	50.00	-39.50	AVG	P

At load/control terminal:

Not Applicable.

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5.2 EN 55014-1 Conducted Common Mode (Asymmetric Mode) Disturbance at wired network Ports

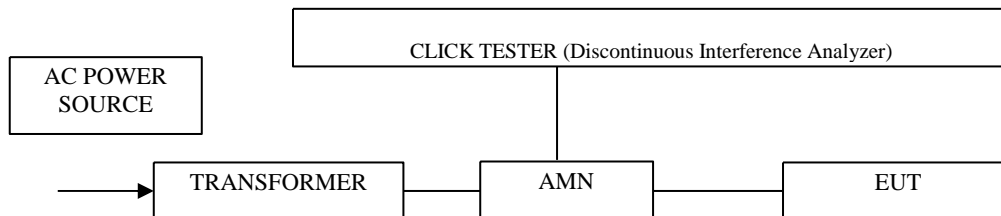
Test Result: Not Applicable

Remark: The test only applies to balanced unscreened ports intended for connection to unscreened balanced pairs.

5.3 EN 55014-1 Discontinuous Conducted Disturbance Voltage

Test Result: Pass

5.3.1 Block Diagram of Test Setup



5.3.2 Test Setup and Procedure

The EUT was placed on a 0.8m high non-metallic table in shielded room, the wall of shielded room used as Ground Reference Plane (GRP), and keeps a distance of at least 0.8m from any of the other metallic surface.

The EUT was connected to an artificial mains network and at a distance of 0.8m from it, the excess lead of EUT was bundled with a length of 0.3m to 0.4m parallel to the main lead. The number of counted clicks above the permitted limit for continuous interference and their duration, spacing and rate were measured during the observation time. When relevant, a permitted(relaxed) limit for clicks was calculated and a second measurement was performed. Determination of compliance with the permitted limit according to the upper quartile method was applied. The frequency 150kHz, 500 kHz, 1.4 MHz and 30 MHz was checked.

When measurements of disturbance are being made, the appliance shall be operated under the conditions defined in Annex A.

TEST REPORT

5.3.3 Test Data and curve

Frequency (MHz)	0.15	0.50	1.40	30.00
Permitted limit for continuous interference (dB μ V)	66	56	56	60
Short Clicks [T<10ms]	40	40	40	40
Mid. Clicks [10ms<T<20ms]	0	0	0	0
Long Clicks [T>20ms]	0	0	0	0
Total clicks (number)	40	40	40	40
Switching operation (number)	--			
Factor	--			
Observation time (min.)	17.2mins	15.4mins		
Click rate, N	2.3	2.6	2.6	2.6
Value to be added (dB)	--	--	--	--
Counted clicks allowed to exceed the permitted limit (number)	--	--	--	--
Permitted limit for clicks (dB μ V)	--	--	--	--
Counted clicks exceeding the limit (number)	--	--	--	--
Complies with the limit (Pass/Fail)	Pass	Pass	Pass	Pass

The appliance was deemed to comply with the limits if fulfilling the three conditions below:

- the click rate is not more than 5.
- none of the caused clicks has a duration longer than 20 ms.
- 90 % of the caused clicks have a duration less than 10 ms.

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5.4 EN 55014-1 Radiated Disturbance (9 kHz-30 MHz)- Magnetic field induced current method

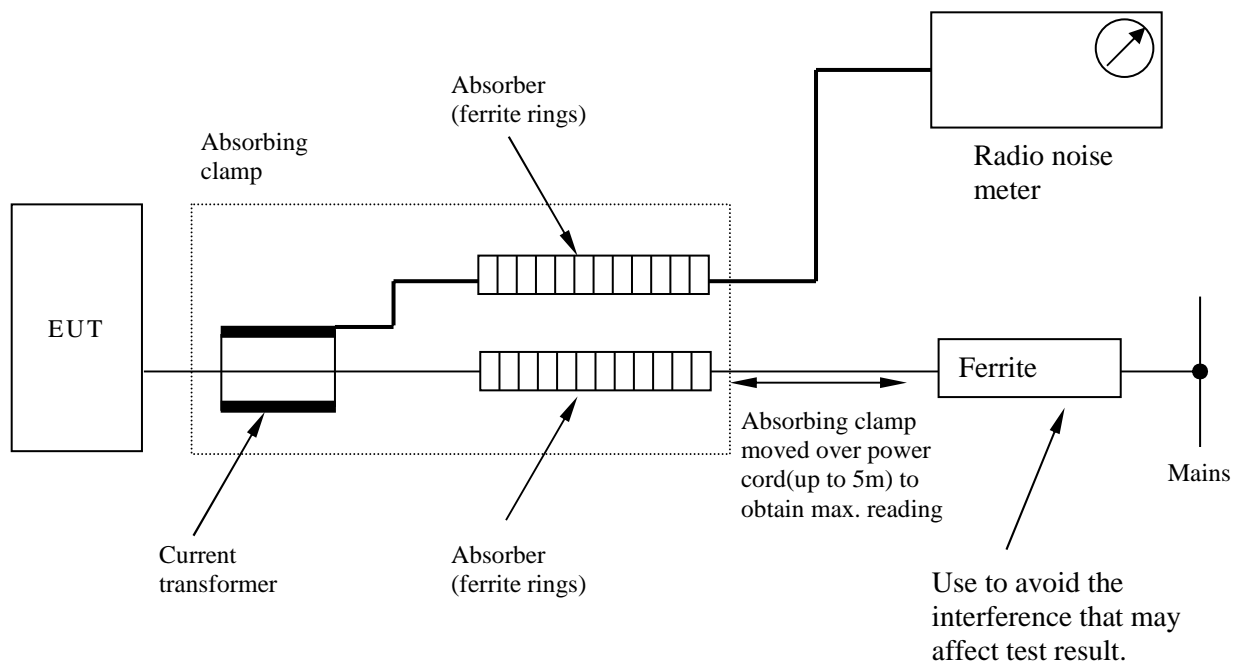
Test Result: Not Applicable

Remark: The test only applies to induction cooking appliances.

5.5 EN 55014-1 Radiated Disturbance Power

Test Result: Pass

5.5.1 Block Diagram of Test Setup



Note: — : power line
 — : signal line

TEST REPORT

5.5.2 Test Setup and Procedure

The disturbance power was measured with the EUT in a shielded room. The height of the table shall be $0,1 \text{ m} \pm 0,025 \text{ m}$ for appliances primarily intended to be positioned on the floor in normal use, and $0,8 \text{ m} \pm 0,05 \text{ m}$ for other appliances. The EUT was placed on a non-metallic table at least 0.8m from other metallic surface and the mains lead of EUT was extended to about 6m long. The auxiliary lead longer than 0.25m but shorter than twice length of absorbing clamp was extend to twice length of clamp and those longer than twice length was extend to 6 meters.

The absorbing clamp was moved along the lead to obtain maximum disturbance. The EUT was set to achieve the maximum emission level, and for each point which appears a relevant high emission level, the absorbing clamp was moved around the lead to get the maximum disturbance value.

The bandwidth of test receiver was set at 120 kHz. The frequency range from 30MHz to 300MHz was checked.

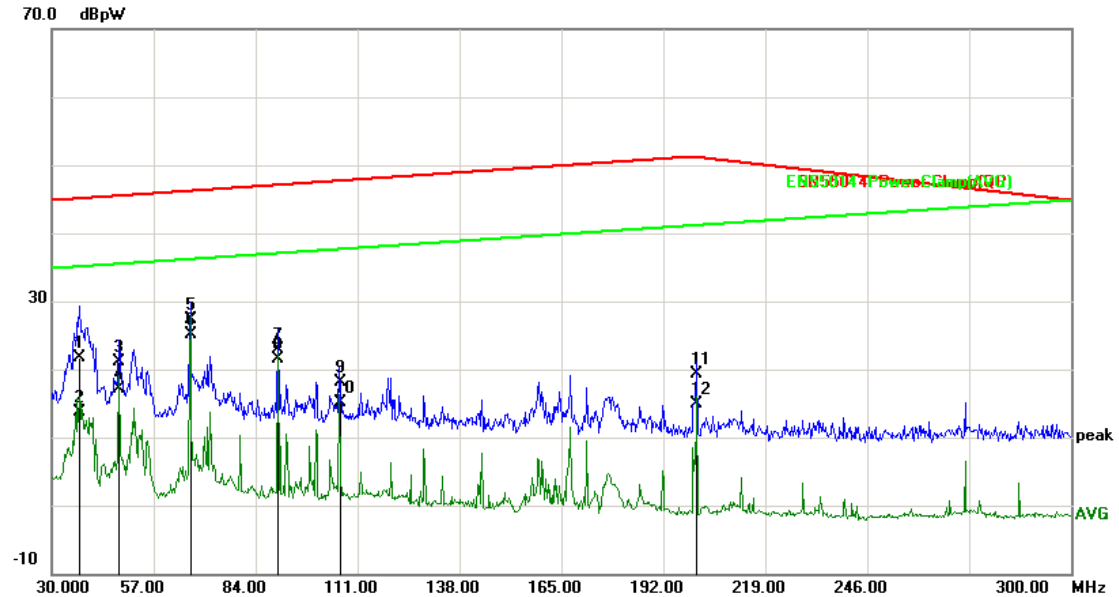
When measurements of disturbance are being made, the appliance shall be operated under the conditions defined in Annex A.

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5.5.3 Test Data and curve

Test port: Mains

Operation Mode: all function on



No.	Frequency (MHz)	Factor (dB)	Reading (dBpW)	Level (dBpW)	Limit (dBpW)	Margin (dB)	Detector	P/F
1	37.5000	7.15	14.50	21.65	45.28	-23.63	QP	P
2	37.5000	7.15	6.50	13.65	35.28	-21.63	AVG	P
3	47.9500	5.28	15.80	21.08	45.67	-24.61	QP	P
4	47.9500	5.28	11.80	17.08	35.66	-18.60	AVG	P
5	66.7500	5.39	21.96	27.35	46.36	-19.01	QP	P
6	66.7500	5.39	19.80	25.19	36.36	-11.17	AVG	P
7	90.0500	5.20	17.80	23.00	47.23	-24.23	QP	P
8	90.0500	5.20	16.40	21.60	37.22	-15.62	AVG	P
9	106.3500	4.93	13.10	18.03	47.83	-29.80	QP	P
10	106.3500	4.93	10.20	15.13	37.83	-22.70	AVG	P
11	200.9500	3.74	15.50	19.24	51.24	-32.00	QP	P
12	200.9500	3.74	11.10	14.84	41.33	-26.49	AVG	P

The measurement quasi-peak data of disturbance power is lower than applicable limit reduced by the margin (0 to 10dB) at frequency range 200 to 300 MHz and the maximum clock frequency is less than 30MHz

TEST REPORT

5.6 EN 55014-1 Radiated Disturbance(30MHz-1000MHz)

Test Result: Not Applicable

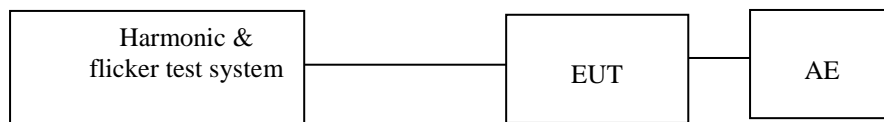
Remark:

Radiated disturbance shall not be conducted, if the measurement quasi-peak data of disturbance power is lower than applicable limit reduced by the margin (0 to 10dB) at frequency range 200 to 300 MHz and the maximum clock frequency is less than 30MHz,.

6 Harmonics of current

Test Result: Pass

6.1 Block Diagram of Test Setup



6.2 Test Setup and Procedure

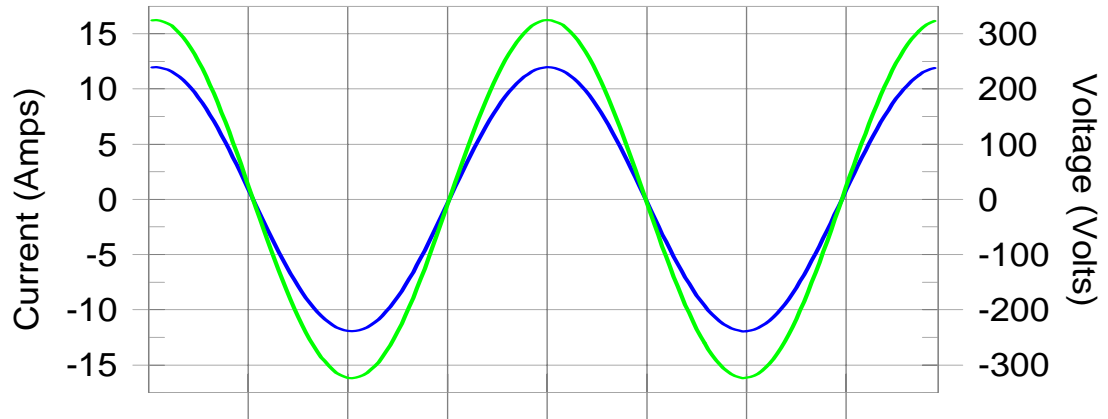
Harmonics of the fundamental current were measured up to 40 order harmonics using a digital power meter with an analogue output and frequency analyser which was integrated in the harmonic & flicker test system. The measurements were carried out under steady conditions.

TEST REPORT

6.3 Test Data

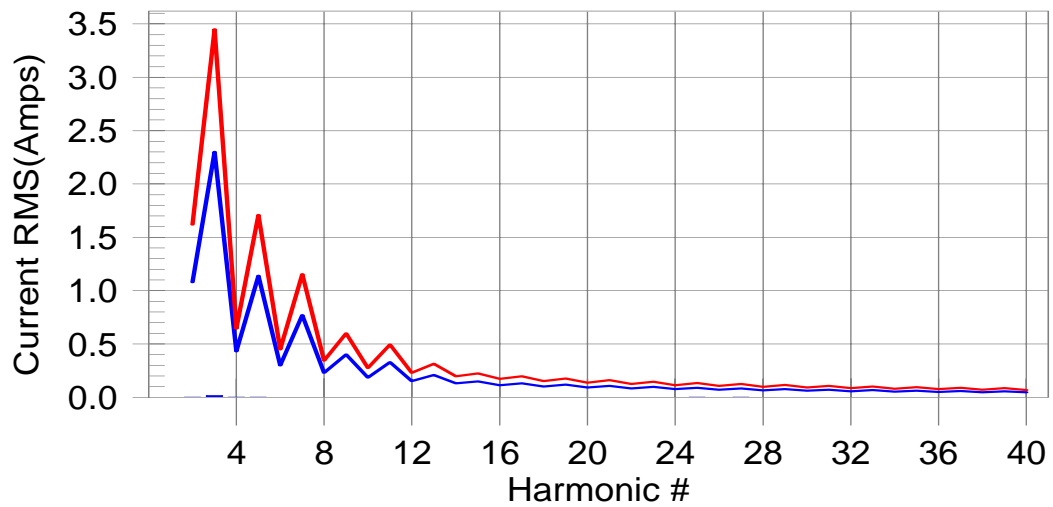
Harmonics – Class-A per Ed. 4.0 (incl. inter-harmonics)

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



TEST REPORT

Current Test Result Summary (Run time)

Test Result: Pass

Source qualification: Normal

Highest parameter values during test:

V_RMS (Volts):	229.34	Frequency(Hz):	50.00
I_Peak (Amps):	12.010	I_RMS (Amps):	8.477
I_Fund (Amps):	8.477	Crest Factor:	4.521
Power (Watts):	1943.6	Power Factor:	1.000

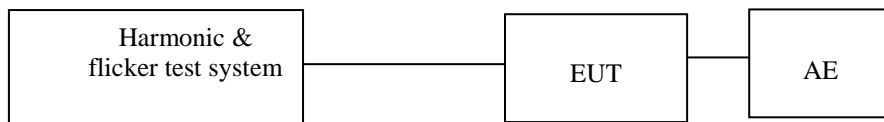
Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.003	1.080	N/A	0.043	1.620	N/A	Pass
3	0.019	2.300	N/A	0.042	3.450	N/A	Pass
4	0.002	0.430	N/A	0.020	0.645	N/A	Pass
5	0.002	1.140	N/A	0.016	1.710	N/A	Pass
6	0.001	0.300	N/A	0.012	0.450	N/A	Pass
7	0.001	0.770	N/A	0.010	1.155	N/A	Pass
8	0.001	0.230	N/A	0.009	0.345	N/A	Pass
9	0.002	0.400	N/A	0.007	0.600	N/A	Pass
10	0.001	0.184	N/A	0.007	0.276	N/A	Pass
11	0.001	0.330	N/A	0.006	0.495	N/A	Pass
12	0.001	0.153	N/A	0.006	0.230	N/A	Pass
13	0.001	0.210	N/A	0.005	0.315	N/A	Pass
14	0.001	0.131	N/A	0.005	0.197	N/A	Pass
15	0.001	0.150	N/A	0.005	0.225	N/A	Pass
16	0.001	0.115	N/A	0.004	0.173	N/A	Pass
17	0.001	0.132	N/A	0.004	0.198	N/A	Pass
18	0.001	0.102	N/A	0.004	0.153	N/A	Pass
19	0.001	0.118	N/A	0.004	0.178	N/A	Pass
20	0.001	0.092	N/A	0.003	0.138	N/A	Pass
21	0.001	0.107	N/A	0.003	0.161	N/A	Pass
22	0.001	0.084	N/A	0.003	0.125	N/A	Pass
23	0.001	0.098	N/A	0.003	0.147	N/A	Pass
24	0.001	0.077	N/A	0.003	0.115	N/A	Pass
25	0.003	0.090	N/A	0.004	0.135	N/A	Pass
26	0.001	0.071	N/A	0.003	0.107	N/A	Pass
27	0.003	0.083	N/A	0.004	0.125	N/A	Pass
28	0.001	0.066	N/A	0.003	0.099	N/A	Pass
29	0.001	0.078	N/A	0.003	0.116	N/A	Pass
30	0.001	0.061	N/A	0.003	0.092	N/A	Pass
31	0.001	0.073	N/A	0.003	0.109	N/A	Pass
32	0.001	0.058	N/A	0.003	0.086	N/A	Pass
33	0.001	0.068	N/A	0.003	0.102	N/A	Pass
34	0.001	0.054	N/A	0.002	0.081	N/A	Pass
35	0.001	0.064	N/A	0.002	0.096	N/A	Pass
36	0.001	0.051	N/A	0.002	0.077	N/A	Pass
37	0.001	0.061	N/A	0.002	0.091	N/A	Pass
38	0.000	0.048	N/A	0.002	0.073	N/A	Pass
39	0.001	0.058	N/A	0.002	0.087	N/A	Pass
40	0.000	0.046	N/A	0.001	0.069	N/A	Pass

TEST REPORT

7 Flicker

Test Result: Pass

7.1 Block Diagram of Test Setup



7.2 Test Setup and Procedure

7.2.1 Definition

Flicker:	impression of unsteadiness of visual sensation induced by a lighting stimulus whose luminance or spectral distribution fluctuates with time.
Pst:	Short-term flicker indicator The flicker severity evaluated over a short period (in minutes); Pst=1 is the conventional threshold of irritability
Plt:	long-term flicker indicator; the flicker severity evaluated over a long period (a few hours). Using successive Pst valuse.
dc:	the relative steady-state voltage change
dmax:	the maximum relative voltage change
d(t):	the value during a voltage change

7.2.2 Test condition

The EUT was set to produce the most unfavourable sequence of voltage changes.

TEST REPORT

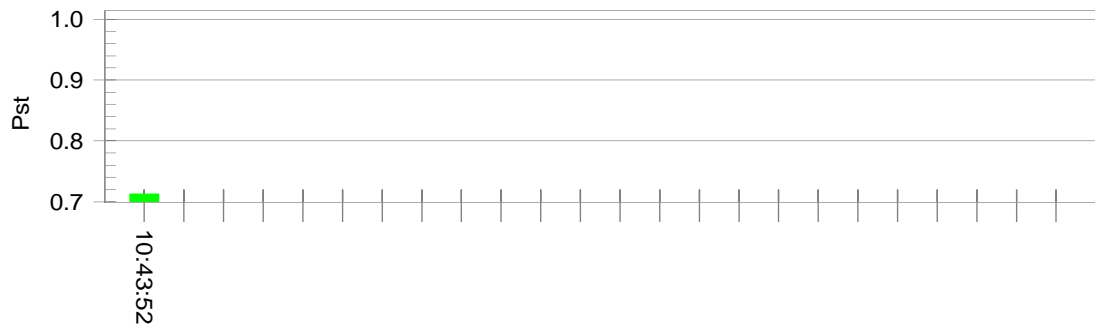
7.3 Test Data

Flicker Test Summary (Run time)

Test Result: Pass Status: Test Completed

Psti and limit line

European Limits



Time is too short for Plt plot

Parameter values recorded during the test:

Vrms at the end of test (Volt):229.24

T-max (mS):	0	Test limit (mS):	500.0	Pass
Highest dc (%):	1.51	Test limit (%):	3.30	Pass
Highest dmax (%):	1.93	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.713	Test limit:	1.000	Pass

TEST REPORT

8 APPENDIX I - PHOTOS OF TEST SETUP

Conducted Emission



Radiated Power



TEST REPORT

Clicks



Harmonics and Flicker



TEST REPORT

9 APPENDIX II – PHOTOS OF EUT

JK09C-01

Overall view



Back view

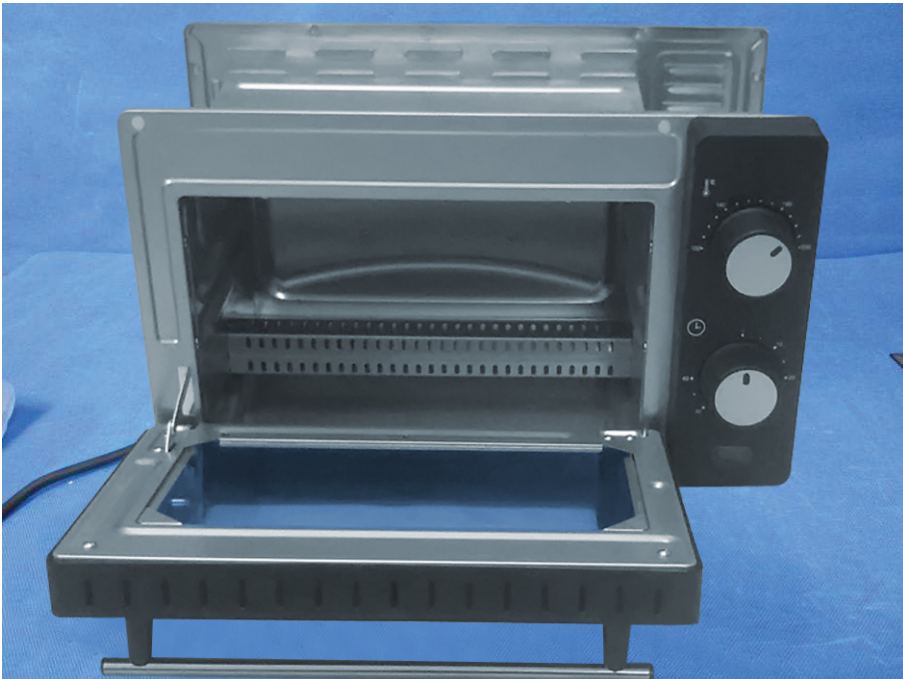


TEST REPORT

Bottom view



Door view

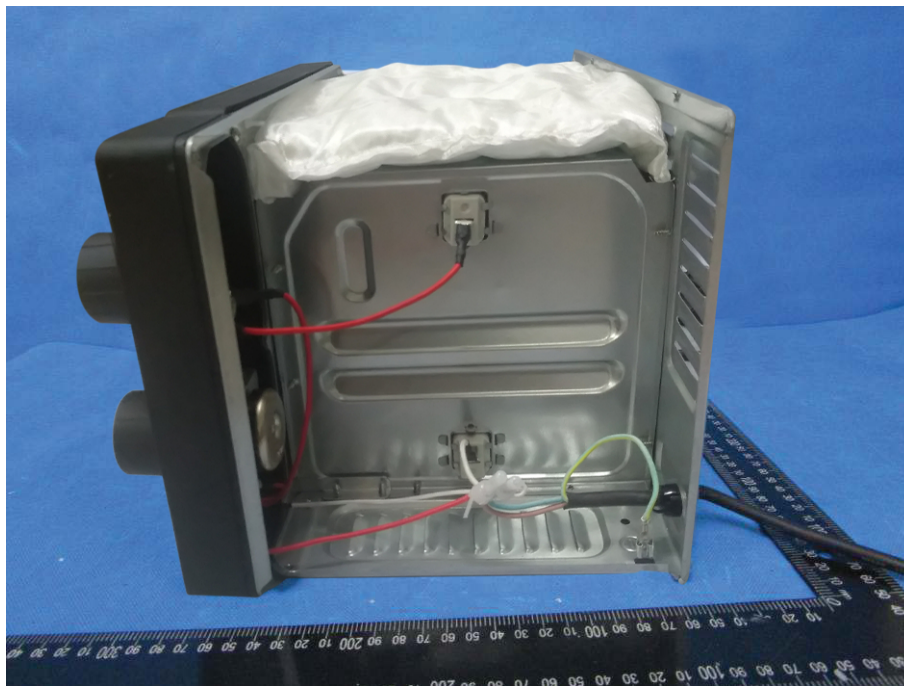


TEST REPORT

Cavity view

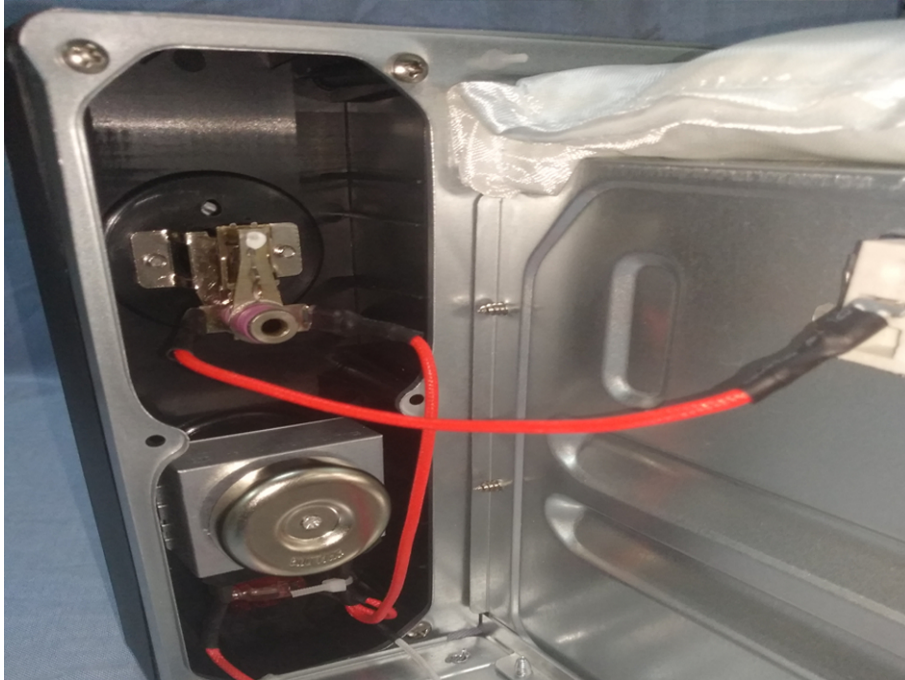


Internal view

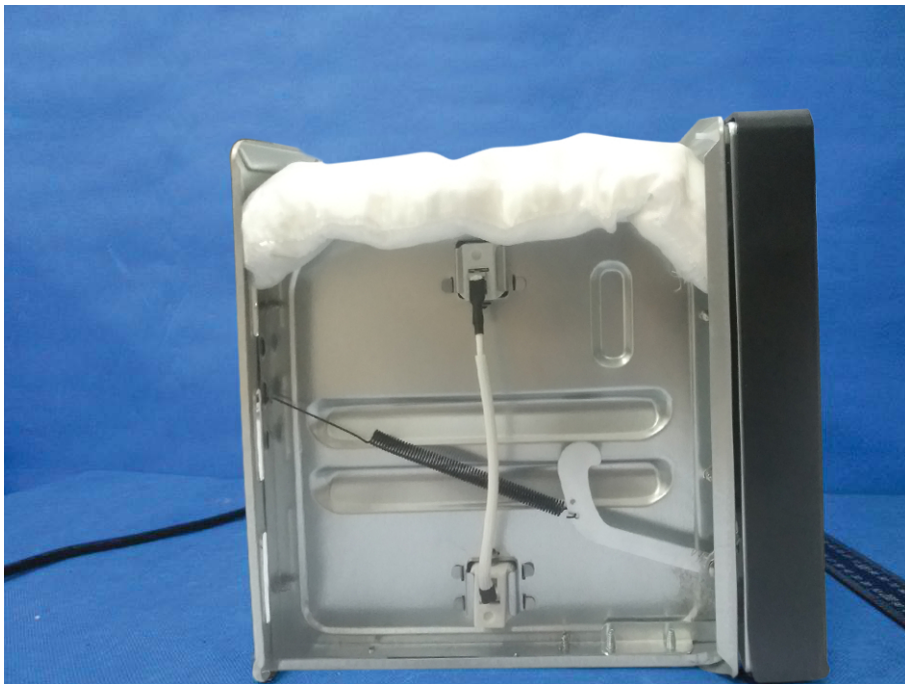


TEST REPORT

Internal view

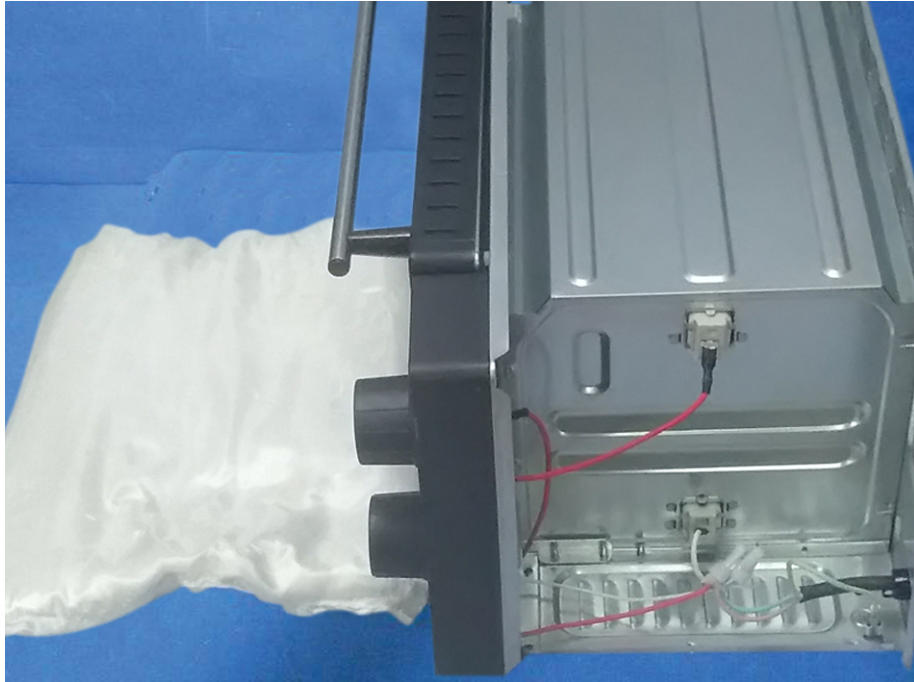


Internal view



TEST REPORT

Internal view



JK48C01-RML



TEST REPORT



Control of model with 3 knob



Control of model with 4 knob

Top view



TEST REPORT

Over all view

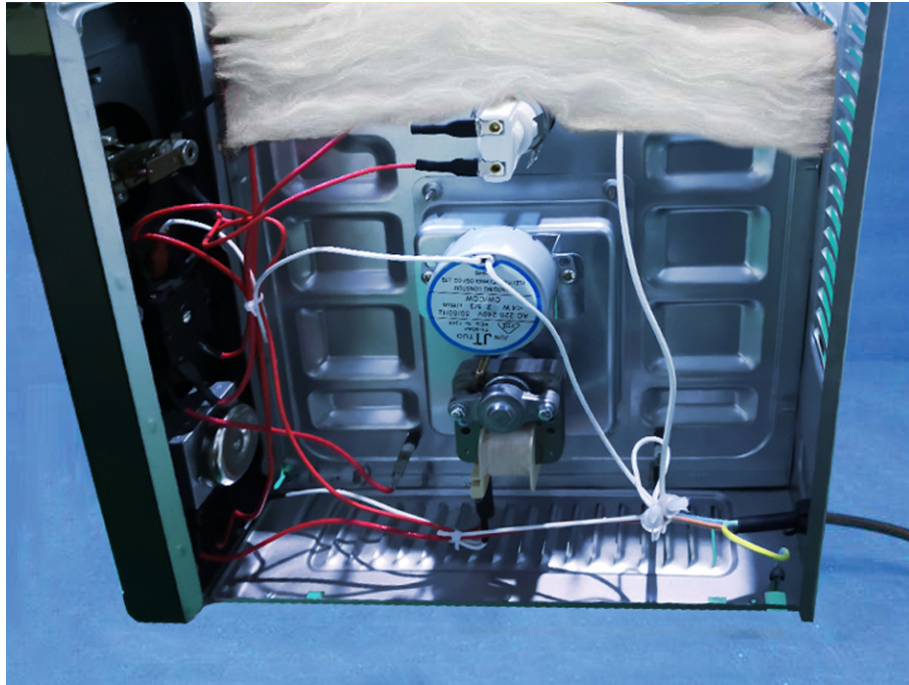


Cavity view

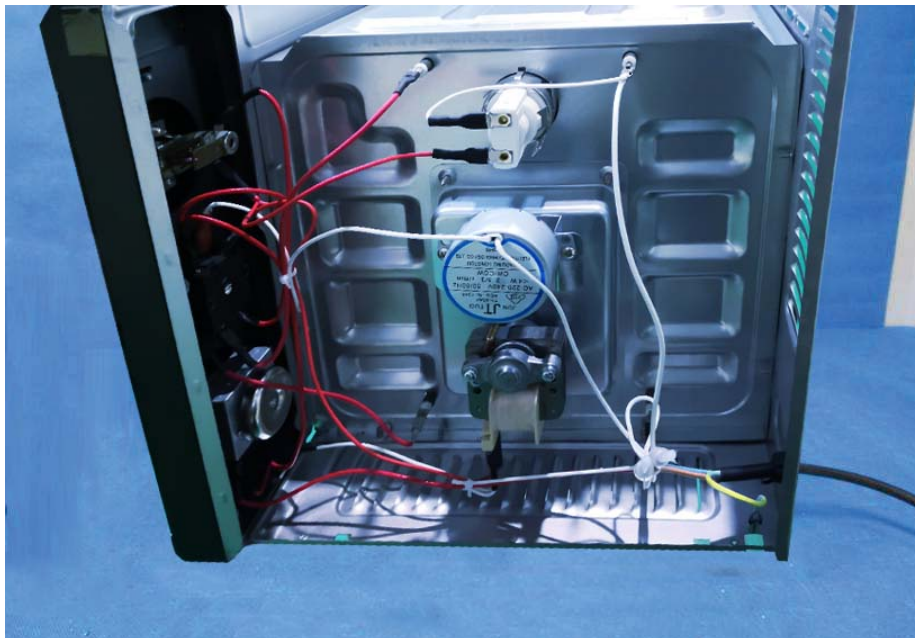


TEST REPORT

Internal view

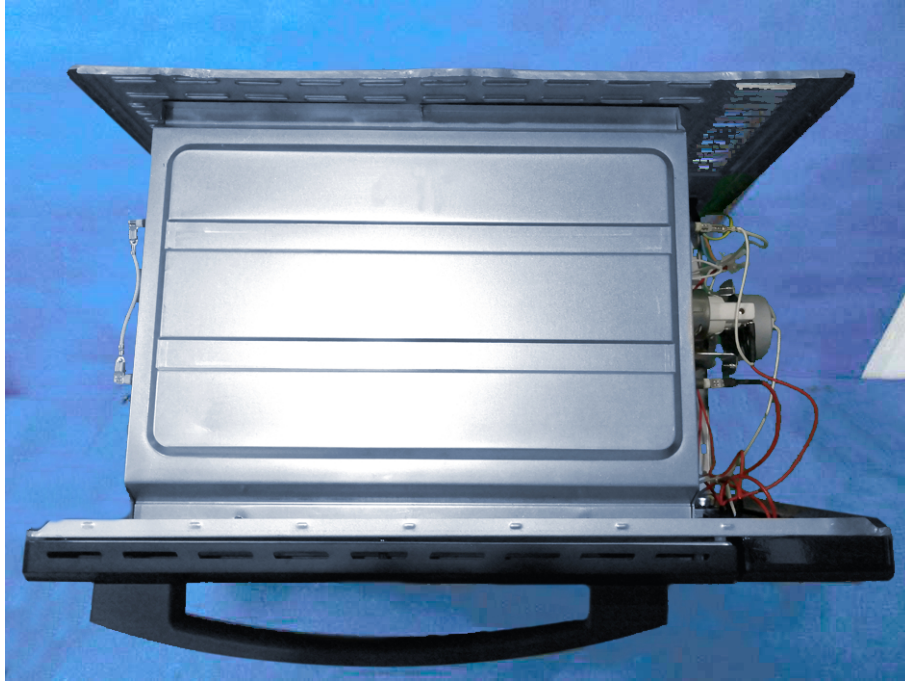


Internal view



TEST REPORT

Internal view



Lamp holder and cover view



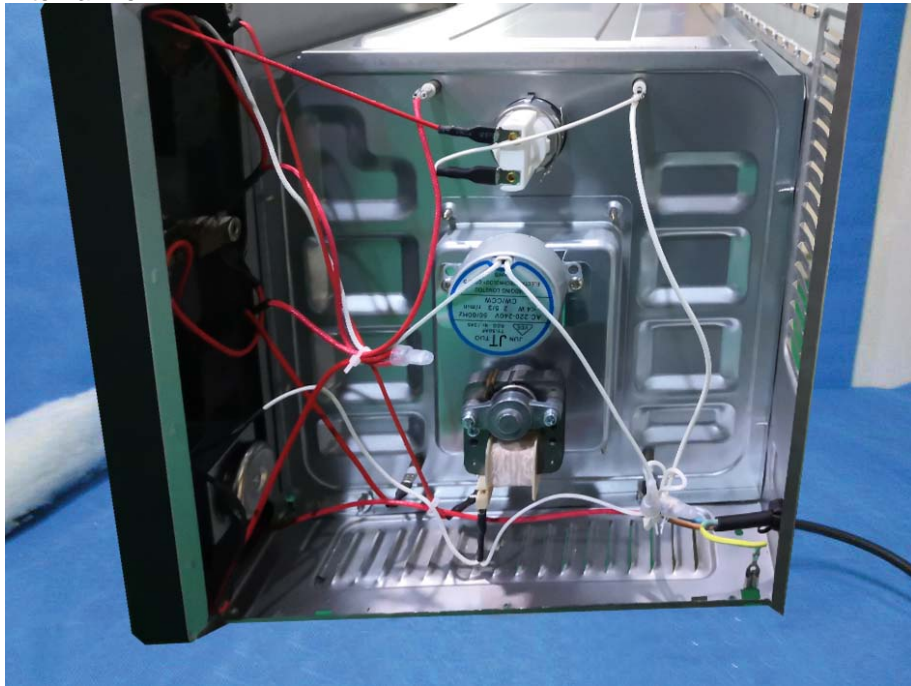
TEST REPORT

JK48C02-RML

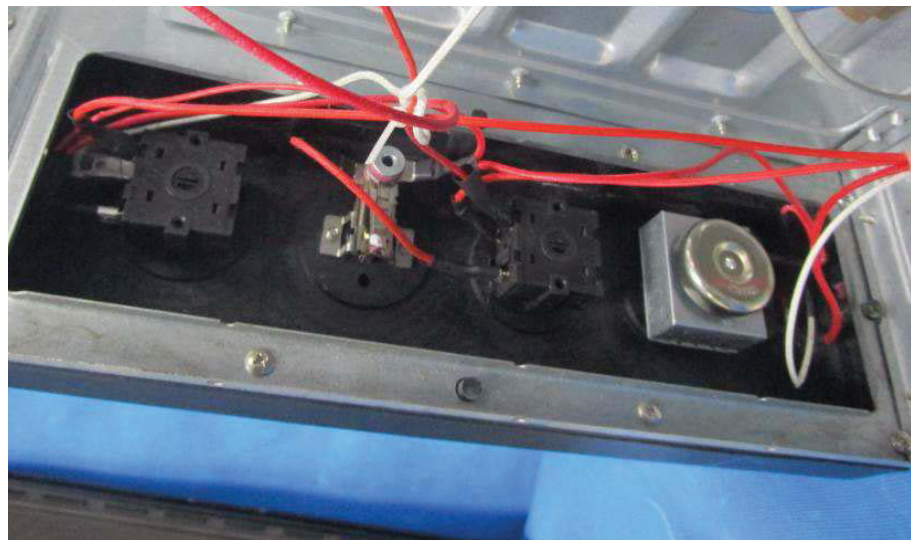


TEST REPORT

Internal view



Internal view



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