



<b>Prüfbericht-Nr.:</b> <i>Test report no.:</i>	<b>50097798 010</b>	<b>Auftrags-Nr.:</b> <i>Order no.:</i>	180233512	Seite 1 von 17 <i>Page 1 of 17</i>	
<b>Kunden-Referenz-Nr.:</b> <i>Client reference no.:</i>	N/A	<b>Auftragsdatum:</b> <i>Order date:</i>	2022.05.05		
<b>Auftraggeber:</b> <i>Client:</i>	NINGBO BAKELON ELECTRICAL APPLIANCE CO., LTD. No.488 Qiye East Road, Zhouxiang Town, Cixi City, Ningbo 315324 Zhejiang P.R. China				
<b>Prüfgegenstand:</b> <i>Test item:</i>	Sandwich Maker				
<b>Bezeichnung / Typ-Nr.:</b> <i>Identification / Type no.:</i>	Refer to page 2				
<b>Auftrags-Inhalt:</b> <i>Order content:</i>	TÜV Rheinland – EMC Service				
<b>Prüfgrundlage:</b> <i>Test specification:</i>	<b>EN IEC 55014-1:2021</b> <b>EN IEC 55014-2:2021</b> <b>EN 61000-3-3:2013+A1+A2</b> <b>EN IEC 61000-3-2:2019+A1</b>				
<b>Wareneingangsdatum:</b> <i>Date of sample receipt:</i>	2022.05.20	Dokumenten-Check (keine Fotodokumentation erforderlich)  Document check (no photo documentation required)			
<b>Prüfmuster-Nr.:</b> <i>Test sample no.:</i>	A003264493-001				
<b>Prüfzeitraum:</b> <i>Testing period:</i>	2022.05.21				
<b>Ort der Prüfung:</b> <i>Place of testing:</i>	Refer to section 1.1				
<b>Prüflaboratorium:</b> <i>Testing laboratory:</i>	TÜV Rheinland / CCIC (Ningbo) Co., Ltd.				
<b>Prüfergebnis*:</b> <i>Test result*:</i>	Pass				
<b>geprüft von:</b> <i>tested by:</i>			<b>genehmigt von:</b> <i>authorized by:</i>		
<b>Datum:</b> <i>Date:</i>	2022.06.07		<b>Ausstelldatum:</b> <i>Issue date:</i>	2022.06.07	
<b>Stellung / Position:</b>	Chao Zhang/PE		<b>Stellung / Position:</b>	Tracy Zhang/TC	
<b>Sonstiges / Other:</b>	Refer to pages 2-3 for further information.				
<b>Zustand des Prüfgegenstandes bei Anlieferung:</b> <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>				
<b>* Legende:</b>	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut 2 = good	3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	4 = ausreichend 4 = sufficient	5 = mangelhaft 5 = poor N/A = nicht anwendbar N/T = nicht getestet N/A = not applicable N/T = not tested
<b>* Legend:</b>	1 = very good P(ass) = passed a.m. test specification(s)	2 = good	3 = satisfactory F(ail) = failed a.m. test specification(s)	4 = sufficient	5 = poor N/A = not applicable N/T = not tested
<b>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</b> <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>					

V05

**Prüfbericht - Nr.: 50097798 010**  
Test Report No.:

Seite 2 von 17  
Page 2 of 17

**Model List:**

No.	Model	Rated Power Input(W)	No.	Model	Rated Power Input(W)
1	ZM-259	1400W	2	ZM-201	750W
3	ZM-259B	1400W	4	ZM-202B	750W
5	ZM-269B	1200W	6	ZM-227	750W
7	ZM-200	750W	8	ZM-227A	750W
9	ZM-200B	750W	10	ZM-228	750W
11	ZM-206	750W	12	ZM-228B	750W
13	ZM-206B	750W	14	ZM-228C	750W
15	ZM-207	750W	16	ZM-228D	750W
17	ZM-207B	750W	18	ZM-707	750W
19	ZM-208	750W	20	ZM-707B	750W
21	ZM-208B	750W	22	ZM-267	800W
23	ZM-707C	750W	24	ZM-266B	800W
25	ZM-267B	800W	26	ZM-278	800W
27	ZM-258B	1400W	28	ZM-229B	1000W
29	ZM-268B	800W	30	ZM-209	750W
31	ZM-220	750W	32	ZM-223	750W
33	ZM-220B	750W	34	ZM-225	750W
35	ZM-221	750W	36	ZM-225B	750W
37	ZM-221B	750W	38	ZM-227C	750W
39	ZM-222	750W	40	ZM-226	800W
41	ZM-222B	750W	42	ZM-260B	800W
43	ZM-234	800W	44	ZM-234B	800W
45	ZM-235	800W	46	ZM-235B	800W
47	ZM-236	800W	48	ZM-236B	800W
49	ZM-237	800W	50	ZM-237B	800W
51	ZM-260C	800W	52	ZM-260D	800W
53	ZM-267C	800W	54	ZM-250B	1400W

**Other aspects:**

1. The input voltage for all models is “AC 220-240V, 50-60Hz”.
2. In electrical characteristics, the new models NO.43-NO.53 are similar to the models NO.1-NO.42 which have been EMC approved in the test reports 50097798 001-009. The differences among them are rated power and in the mechanical aspects.

**Prüfbericht - Nr.: 50097798 010**

*Test Report No.:*

**Seite 3 von 17**

*Page 3 of 17*

3. The standard EN 61000-3-3:2013+A1 has been updated to EN 61000-3-3:2013+A1+A2 respectively.
4. The model ZM-250B is a whole new model, therefore, EMC tests were performed on model ZM-250B.

## TEST SUMMARY

4.1.1 HARMONICS ON AC MAINS

*Result:*

*Pass*

4.1.2 VOLTAGE CHANGES, VOLTAGE FLUCTUATIONS AND FLICKER ON AC MAINS

*Result:*

*Pass*

4.1.3 MAINS TERMINAL CONTINUOUS DISTURBANCE VOLTAGE

*Result:*

*Pass*

4.1.4 DISCONTINUOUS INTERFERENCE ON AC MAINS

*Result:*

*Pass*

4.2.1 DISTURBANCE POWER

*Result:*

*Pass*

4.2.2 RADIATED DISTURBANCE IN THE FREQUENCY RANGE FROM 30MHZ TO 1000MHZ

*Result:*

*Pass*

5 IMMUNITY

*Result:*

*Pass*

## Contents

<b>1</b>	<b>TEST SITES .....</b>	<b>6</b>
1.1	TEST FACILITIES.....	6
1.2	LIST OF TEST AND MEASUREMENT INSTRUMENTS.....	6
1.3	MEASUREMENT UNCERTAINTY .....	6
<b>2</b>	<b>GENERAL PRODUCT INFORMATION.....</b>	<b>7</b>
2.1	PRODUCT FUNCTION AND INTENDED USE.....	7
2.2	RATINGS AND SYSTEM DETAILS.....	7
2.3	INDEPENDENT OPERATION MODES.....	7
2.4	NOISE GENERATING AND NOISE SUPPRESSING PARTS .....	7
2.5	SUBMITTED DOCUMENTS.....	7
<b>3</b>	<b>TEST SET-UP AND OPERATION MODES.....</b>	<b>8</b>
3.1	PRINCIPLE OF CONFIGURATION SELECTION .....	8
3.2	PHYSICAL CONFIGURATION FOR TESTING.....	8
3.3	TEST OPERATION AND TEST SOFTWARE .....	8
3.4	SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT .....	8
3.5	COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE .....	8
<b>4</b>	<b>TEST RESULTS EMISSION .....</b>	<b>9</b>
4.1	EMISSION IN THE FREQUENCY RANGE UP TO 30 MHz .....	9
4.1.1	<i>Harmonics on AC Mains .....</i>	<i>9</i>
4.1.2	<i>Voltage changes, voltage fluctuations and flicker on AC mains .....</i>	<i>10</i>
4.1.3	<i>Mains Terminal Continuous Disturbance Voltage.....</i>	<i>11</i>
4.1.4	<i>Discontinuous Interference on AC Mains .....</i>	<i>12</i>
4.2	EMISSION IN THE FREQUENCY RANGE ABOVE 30 MHz.....	12
4.2.1	<i>Disturbance Power .....</i>	<i>13</i>
4.2.2	<i>Radiated Disturbance in the Frequency Range from 30MHz to 1000MHz.....</i>	<i>14</i>
<b>5</b>	<b>TEST RESULTS IMMUNITY .....</b>	<b>15</b>
<b>6</b>	<b>PHOTOGRAPHS OF THE TEST SET-UP.....</b>	<b>16</b>
<b>7</b>	<b>LIST OF TABLES.....</b>	<b>17</b>
<b>8</b>	<b>LIST OF PHOTOGRAPHS .....</b>	<b>17</b>

## 1 Test Sites

### 1.1 Test Facilities

Laboratory: TÜV Rheinland /CCIC(Ningbo) Co., Ltd.

**1<sup>st</sup> Floor, Building 11, Scholar Innovation Park, No.1188 Zhongguan Road, Zhenhai District, Ningbo 315200 P.R. China.**

The used test equipment is in accordance with CISPR 16-1 series standards for measurement of radio interference.

### 1.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

No.	Equipment	Model	Serial No.	Cal. due date
5	Harmonic power supply	5001IX-CTS-400-413	1735A02292	2022.11.07
6	Harmonics/voltage fluctuation Analyser	PACS-1	1736A00799	2022.11.07
7	Click Analyzer	DDA55	14041726085	2022.11.08
8	LISN	LS16C/10	16011726408	2022.11.08

### 1.3 Measurement Uncertainty

Test Item	Expanded Measurement Uncertainty (k=2)
Conducted Emission (9-150kHz)	3.70dB
Conducted Emission (150k-30MHz)	3.30dB
Disturbance Power	4.27dB
Radiated Emission (30-1000MHz)	4.39dB
Radiated Emission (1-18GHz)	4.67dB
Radiated Emission (CDNE method)	4.05dB

## 2 General Product Information

### 2.1 Product Function and Intended Use

The EUT (equipment under test) is an ordinary Sandwich Maker for household and similar use. For the further information, refer to the user's manual.

### 2.2 Ratings and System Details

Rated voltage	:	Refer to page 2
Frequency	:	Refer to page 2
Rated power	:	Refer to page 2
Protection class	:	I

Refer to the Circuit Diagram for further information.

### 2.3 Independent Operation Modes

The basic operation modes are: "On" or "Off".  
Refer to the user's manual for further information.

### 2.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram for further information.

### 2.5 Submitted Documents

Circuit diagram, user's manual, labels etc.

## 3 Test Set-up and Operation Modes

### 3.1 Principle of Configuration Selection

**Emission:** The equipment under test (EUT) was configured to measure its highest possible radiation level. The test conditions were adapted accordingly in reference to the instructions for use.

Refer to the related paragraph of this report.

**Immunity:**

Refer to the related paragraph of this report.

### 3.2 Physical Configuration for Testing

Refer to the related paragraph of this report.

### 3.3 Test Operation and Test Software

Refer to the related paragraph of this report. No software was used.

### 3.4 Special Accessories and Auxiliary Equipment

None.

### 3.5 Countermeasures to achieve EMC Compliance

The tested sample contained no noise suppression components. No special measure is employed to achieve the requirement.

**Prüfbericht - Nr.: 50097798 010**  
Test Report No.:

Seite 9 von 17  
Page 9 of 17

## 4 Test Results EMISSION

### 4.1 Emission in the Frequency Range up to 30 MHz

#### 4.1.1 Harmonics on AC Mains

<b>Result:</b>	<b>Pass</b>
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Test procedure : EN IEC 61000-3-2:2019+A1  
Harmonic order : 2 – 40<sup>th</sup>

According to the electrical characteristics of the EUT, it will not produce harmonics, which might exceed the related limits because all the components/parts in the EUT worked at mains frequency and the heating element is resistive.

Therefore, the EUT is deemed to meet the harmonics requirements of EN IEC 61000-3-2:2019+A1 without actual testing.

**Prüfbericht - Nr.: 50097798 010**  
 Test Report No.:

**Seite 10 von 17**  
 Page 10 of 17

### 4.1.2 Voltage changes, voltage fluctuations and flicker on AC mains

<b>Result:</b>	<b>Pass</b>
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Date of testing : 2022.05.21  
 Test procedure : EN 61000-3-3:2013+A1+A2  
 Ambient Condition : Temperature: 21°C; Relative Humidity: 63%

- the value of  $P_{st}$  shall not be greater than 1.0;
- the value of  $d(t)$  during a voltage change shall not exceed 3.3% for more than 500ms;
- the relative steady-state voltage change,  $d_c$ , shall not exceed 3.3%;
- the maximum relative voltage change  $d_{max}$ , shall not exceed 6%.

Following are the measurement results obtained via an automatic testing system.

**Table 2: Voltage fluctuations and flicker measurement results**

	$d_c$	$d_{max}$ (average)	$d(t)$	$P_{st}$
<b>Limits</b>	3.3%	6%	3.3%/500ms	1.0
<b>Result</b>	1.08%	1.15%	0ms	0.413

**Prüfbericht - Nr.: 50097798 010**

Test Report No.:

Seite 11 von 17

Page 11 of 17

### 4.1.3 Mains Terminal Continuous Disturbance Voltage

**Result:**

**Pass**

Basic Standard : EN IEC 55014-1:2021

Frequency Range : 150kHz – 30MHz

According to the electrical characteristic of the appliance, it contains heating element which work at mains frequency and which cannot produce continuous disturbance voltage exceeding the limits for continuous disturbance voltage prescribed by EN IEC 55014-1:2021. Thus, the sample is deemed to meet the requirements for continuous disturbance voltage without actual testing.

#### 4.1.4 Discontinuous Interference on AC Mains

<b>Result:</b>	<b>Pass</b>
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Date of testing	: 2022.05.21
Test procedure	: EN IEC 55014-1:2021 and CISPR 16-1 series standards
Kind of test site	: EMC shielded room
Port	: Mains
Basic standard	: EN IEC 55014-1:2021
Frequency range	: 0.15 – 30MHz
Limit	: EN IEC 55014-1:2021, clause 4.4 (Household Appliance)
Operating Condition	: EN IEC 55014-1:2021, Annex A.4
Ambient Condition	: Temperature: 21°C; Relative Humidity: 62%

#### Measuring configuration and description

The discontinuous interference on AC mains in the frequency range from 0.15 to 30MHz was measured in accordance to EN IEC 55014-1:2021.

The measurement setup was made according to EN IEC 55014-1:2021, clause 4.4 in a shielding room. The used measurement equipment was in accordance to CISPR 16-1 series standards.

The test setup is according to clause A.4 of EN IEC 55014-1:2021.

The clicks were measured when the thermostat of the EUT started or stopped.

The clicks were measured at the frequency of 0.15MHz, 0.5MHz, 1.4MHz and 30MHz.

The tests include RUN A and RUN B. The first one is to detect the Click rate and RUN B is to detect how many clicks overtop the limits that are calculated according the formula below.

For  $0.2 \leq N < 30$  the Sensitivity = RUN A +  $20 \cdot \log(30/\text{Click rate})$  and for  $N < 0.2$  the Sensitivity = RUN A + 44.

**Table 3: Click Test Results of RUN A**

Measured Frequency (MHz)	0.15	0.5	1.4	30
Sensitivity(dBuV)	66.0	56.0	56.0	60.0
Last Time T(min./sec.)	120	120	120	120
Short Click Number n1	13	13	12	0
Long Click Number n2	0	0	0	0
Total Click Number n=n1+n2	13	13	12	0
Click Rated $N=F \times n/T$	0.11			

According to the clause 5.4.3.4 of EN IEC 55014-1:2021:

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

These conditions shall be verified at one frequency only, 150 kHz or 500 kHz, at which the higher click rate occurs. If one of these conditions is not satisfied then limits in accordance with 5.4.2 apply.”

**Prüfbericht - Nr.: 50097798 010**

Test Report No.:

Seite 13 von 17

Page 13 of 17

## 4.2 Emission in the Frequency Range above 30 MHz

### 4.2.1 Disturbance Power

<b>Result:</b>	<b>Pass</b>
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Basic Standard : EN IEC 55014-1:2021

Frequency Range : 30 – 300MHz

According to the electrical characteristic of the appliance it contains heating element which work at mains frequency and cannot produce disturbance power exceeding the limits for disturbance power prescribed by EN IEC 55014-1:2021.

Thus, the sample is deemed to meet the requirements for disturbance power without actual testing.

**Prüfbericht - Nr.: 50097798 010**  
Test Report No.:

Seite 14 von 17  
Page 14 of 17

#### 4.2.2 Radiated Disturbance in the Frequency Range from 30MHz to 1000MHz

**Result:**

**Pass**

Port : Enclosure  
Basic Standard : EN IEC 55014-1:2021  
Frequency Range : 30 –1000MHz

According to a) of clause 4.3.4.2 of EN IEC 55014-1:2021:

“The EUT shall be also deemed to comply with the requirement of this document in the frequency range from 300 MHz to 1000 MHz without further testing if both conditions 1) and 2) below are fulfilled:

- 1): the disturbance power emission from the EUT is lower than the limits of Table 7 reduced by the values of Table 8
- 2): the maximum clock frequency shall be less than 30MHz.”

Because the EUT meets the two conditions mentioned above, the EUT is deemed to meet the radiated requirements without actual testing.

## 5 Test Results I M M U N I T Y

The immunity test was not necessary for the EUT because it belongs to category I apparatus according to EN IEC 55014-2:2021, i.e.

“Category I: equipment containing no electronic control circuitry.

EXAMPLES Appliances, tools and toys that contain no electronic control circuits and only electromechanical components such as switches, thermostats, brush motors, induction motors, heating elements, lighting toys containing only batteries and LED.

Electrical circuits consisting of passive components (such as radio interference suppression capacitors or inductors, mains transformers, mains frequency rectifiers) are not considered to be electronic control circuitry. equipment containing no electronic control circuitry. Apparatus containing no electronic control circuitry, for example motor operated appliances, toys, tools, heating appliances and similar apparatus (such as UV and IR radiators).”

According to clause 7.2.2 of EN IEC 55014-2:2021, the EUT is deemed to fulfill the relevant immunity requirements without actual testing.

## 6 Photographs of the Test Set-Up

**Photograph 1: Set-up for Click**



**Photograph 2: Set-up for Emission of Voltage Fluctuation and Flicker**



## 7 List of Tables

Table 1: List of Test and Measurement Equipment .....	6
Table 2: Voltage fluctuations and flicker measurement results .....	10
Table 3: Click Test Results of RUN A.....	12

## 8 List of Photographs

Photograph 1: Set-up for Click .....	16
Photograph 2: Set-up for Emission of Voltage Fluctuation and Flicker.....	16

-- The END --