

Test Report

Report No. : HA0121NB111784EM-R1
Applicant : Ningbo Zhongdi Industry & Trade Co., Ltd
Address : Jishigang Industry Zone, Haishu District, Ningbo 315171,
P. R. China
Trade Mark(s) : ZD
Manufacturer : Same as applicant
Address : Same as applicant
Manufacturing site : Same as applicant
Address : Same as applicant

Equipment Under Test (EUT):

EUT Name : Slodering Iron
Model/Type No. : Refer to page 4
Standards : Refer to page 2
Date of Receipt : November 23, 2021 (Based on original report
HA0121NB111784EM)
Date of Test : November 24, 2021 to December 15, 2021 (Based on original
report HA0121NB111784EM)
Date of Issue : November 08, 2023
Test Result : **PASS***

Prepared By:
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Prepared By



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Reviewed By



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Technical Manager

*The test results have been reviewed against the Directives above and found to meet their essential requirement. The results shown in this test report refer only to the sample(s) tested. This document cannot be reproduced except in full, without prior written approval of HATEK.

1 Test Summary

1.1 Test Items

Test Items	Result
Disturbance Voltage on Mains Terminal 0.15MHz- 30MHz	P
Discontinuous Disturbance Voltage/Click	P
Continuous Disturbance Power, 30MHz - 300MHz	P
Radiation Emission, 30MHz - 1000MHz	N/A
Harmonic Current	P
Voltage Fluctuations-Flicker	P
ESD	N/A
Radiated Immunity (80MHz - 1GHz)	N/A
Electrical Fast Transients (EFT)	N/A
Surge Immunity	N/A
Injected Currents, 0.15MHz - 230MHz	N/A
Power Frequency Magnetic Field Immunity	N/A
Voltage Dips and Interruptions	N/A
Remark:	P: Pass/ F: Fail/ N/A: Not Applicable

1.2 Test Specification

The equipment(s) comply with the requirements according to the following standards:

EN IEC 55014-1:2021 : Electromagnetic compatibility-Requirements for household appliances, electric tools and similar apparatus Part1: Emission;

EN IEC 55014-2:2021 : Electromagnetic compatibility-Requirements for household appliances, electric tools and similar apparatus Part2: Immunity;

EN IEC 61000-3-2:2019+A1:2021: Limits for harmonic current emissions (equipment input current ≤ 16 A per phase);

EN 61000-3-3:2013+A1:2019+A2:2021: Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current ≤ 16 A per phase and not subject to conditional connection.

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2 General Information

2.1 Client Information

Applicant : Ningbo Zhongdi Industry & Trade Co., Ltd

Address : Jishigang Industry Zone, Haishu District, Ningbo 315171,
P. R. China

2.2 General Description of E.U.T.

Model No. : ZD-507(150W), ZD-507(100W), ZD-507(80W),
ZD-507A(150W), ZD-507A(100W), ZD-507A(80W),
ZD-507E(150W), ZD-507E(100W), ZD-507E(80W),
ZD-507F(150W), ZD-507F(100W), ZD-507F(80W),
ZD-507M(150W), ZD-507M(100W)

Rated input : AC 220-240V, 50Hz, 150W for ZD-507(150W),
ZD-507A(150W), ZD-507E(150W), ZD-507F(150W) and ZD-
507M(150W); 100W for ZD-507(100W), ZD-507A(100W),
ZD-507E(100W), ZD-507F(100W) and ZD-507M(100W);
80W for ZD-507(80W), ZD-507A(80W), ZD-507E(80W) and
ZD-507F(80W)

Protection class : Class II

2.3 Identifies and differences:

HA0121NB111784EM-R1:

The original test report HA0121NB111784EM, issued on December 16, 2021 was modified.

As required by client, add new models ZD-507M(150W) and ZD-507M(100W) in this report.

In electrical characteristics, the new model ZD-507M(150W) and ZD-507(150W) are only different in appearance, and the model ZD-507M(100W) and ZD-507M(150W) are only different in power.

The samples have been received and checked. According to the contents of update, no additional test is needed.

2.4 Environment

- ☒ Residential (domestic) environment
- ☒ Commercial and light-industrial environment
- ☐ Industrial environment
- ☐ Medical environment.

2.5 Submitted Documents

Constructional Data Form for EMC

Circuit diagram, user's manual, labels and construction drawings etc.

3 Test Facility and Instrument list

3.1 Test Facility

All the tests done in this report are subcontracted to Shenzhen Most Technology Service Co., Ltd. (No.5, 2nd Langshan Road, North District, Hi-tech Industrial Park, Nanshan, Shenzhen, Guangdong. China)

3.2 Instrument list

Table 1: List of Test and Measurement Equipment of Laboratory

Shielding Room - Disturbance Voltage Test				
Equipment	Manufacturer	Model	Serial No.	Due Date
Receiver	R&S	ESR3	102043	08/25/2024
LISN	R&S	ENV216	102058	08/25/2024
Absorbing Clamp	R&S	MDS21	100789	06/10/2024
ESD Simulator	EM-TEST	ESD 30N	P1526159867	11/18/2023
3M Chamber & Accessory Equipment	TDK	SAC-3	----	---
Signal Generator	R&S	SMB100A	179680	08/25/2024
Stacked double Log.-Per. Antenna	R&S	HL046E	-----	N/A
Power Amplifier	R&S	BBA150-BC1000	102131	08/25/2024
Power Amplifier	BONN	1060-400/100D	1610682	N/A
Stacked Double Log-Per Antenna	SCHWARZBECK	STLP9149	9149435	N/A
Compact Generator	EM-TEST	UCS500N7	P1608172945	08/25/2024
coupling/decoupling network	EM-TEST	CNI503B7	P1626181212	08/25/2024
Motorized Variac	EM-TEST	MV2616	P1532162313	08/25/2024
Signal Generator	R&S	SMC100A	105636	08/25/2024
Power Amplifier	R&S	BBA150A200 B250	102124	08/25/2024
Attenuator	Bird	300-A-FFN-06	1617	08/25/2024
CDN	FCC	FCC-801-M2/M3-16A	170209	08/25/2024
Harmonic & Flicker System	EM-TEST	DPA 503N& AIF 503N32.1	P1545166605 & P1613178045	08/25/2024
Multifunction AC/DC Power Source	EM-TEST	NetWave 30-400	P1613178144	08/25/2024

3.3 Measurement Uncertainty

Conducted Emission (9-150KHz)	:	U = 3.6 dB
Conducted Emission (150K-30MHz)	:	U = 3.6 dB
Disturbance Power	:	U = 3.6 dB
Radiated Emission (30-1000MHz)	:	U = 4.5 dB
Radiated Emission (1- 6GHz)	:	U = 5.5dB
Expanded Measurement Uncertainty (K=2)		

4 Test Results EMISSION

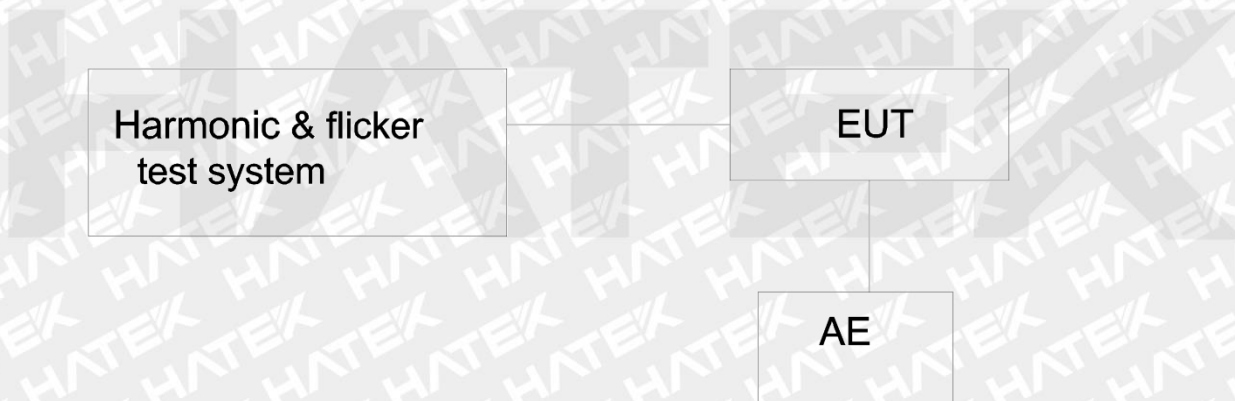
4.1 Emission in the Frequency Range from 0 kHz to 30 MHz

4.1.1 Harmonics on AC Mains

General test information

Temperature	: 25°C
Relative Humidity	: 51 %RH
Test procedure	: EN IEC 61000-3-2:2019+A1:2021
Test duration	: 2.5min
Harmonic order	: 2 – 40 th
Frequency range	: 0 – 2kHz
Test result	: Pass

Block Diagram of Test Set up



Test Procedure

The harmonics on AC Mains in the frequency from 0 to 2 kHz were measured in accordance with EN IEC 61000-3-2:2019+A1:2021.

The measurement of 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. This equipment is in compliance with the requirements of EN IEC 61000-3-2:2019+A1:2021.

The results indicated in the following tables and figures were those measured and recorded by an automatic measuring system.

Table 2: Harmonic currents measurement result

Measurement Standard : EN61000-4-7:2002+A1:2009

Limits Applied : EN61000-3-2:2014 Class A Limits Apply.

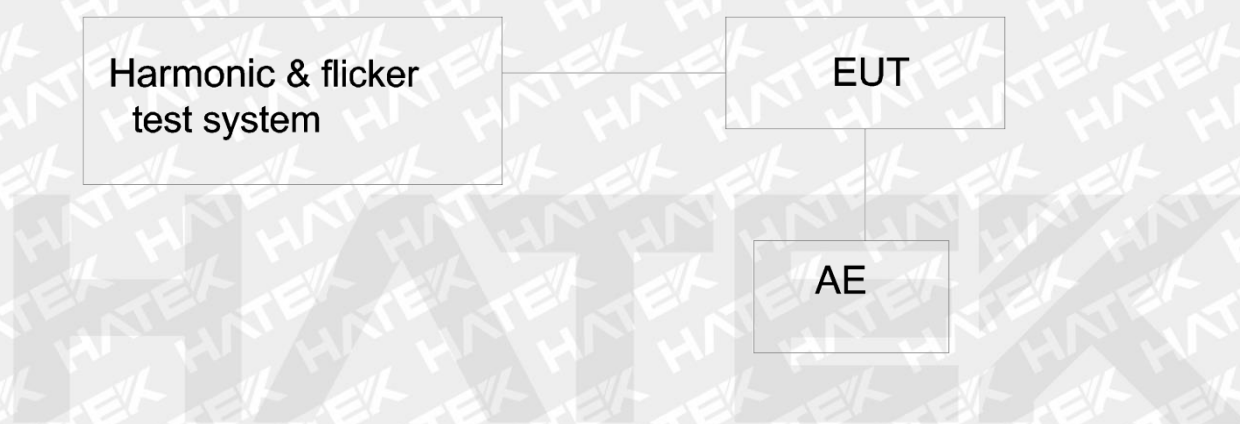
Harmonic Number	Limit Current mA	Average (filtered) mA	% Limit	max. Value (Filtered) mA	% Limit	Assessment
Fundamental :		1855.6				
2 :	1080.0	0.3	0.0	0.5	0.0	Pass
3 :	2300.0	351.8	15.3	352.8	15.3	Pass
4 :	430.0	0.3	0.1	0.7	0.2	Pass
5 :	1140.0	36.0	3.2	36.1	3.2	Pass
6 :	300.0	0.2	0.1	0.3	0.1	Pass
7 :	770.0	17.9	2.3	18.1	2.4	Pass
8 :	230.0	0.1	0.0	0.1	0.0	Pass
9 :	400.0	2.2	0.6	2.5	0.6	Pass
10 :	184.0	0.1	0.1	0.1	0.1	Pass
11 :	330.0	1.5	0.5	1.9	0.6	Pass
12 :	153.3	0.1	0.1	0.1	0.1	Pass
13 :	210.0	1.0	0.5	1.2	0.6	Pass
14 :	131.4	0.1	0.1	0.1	0.1	Pass
15 :	150.0	1.0	0.7	1.2	0.8	Pass
16 :	115.0	0.1	0.1	0.1	0.1	Pass
17 :	132.3	0.3	0.2	0.3	0.2	Pass
18 :	102.2	0.1	0.1	0.1	0.1	Pass
19 :	118.4	1.7	1.4	1.7	1.4	Pass
20 :	92.0	0.5	0.5	0.7	0.8	Pass
21 :	107.1	2.3	2.1	2.5	2.3	Pass
22 :	83.6	1.8	2.2	2.1	2.5	Pass
23 :	97.8	11.0	11.2	11.5	11.8	Pass
24 :	76.7	2.0	2.6	2.5	3.3	Pass
25 :	90.0	9.3	10.3	9.8	10.9	Pass
26 :	70.8	0.6	0.8	0.7	1.0	Pass
27 :	83.3	2.0	2.4	2.1	2.5	Pass
28 :	65.7	0.1	0.2	0.1	0.2	Pass
29 :	77.6	1.5	1.9	1.6	2.1	Pass
30 :	61.3	0.1	0.2	0.1	0.2	Pass
31 :	72.6	0.3	0.4	0.3	0.4	Pass
32 :	57.5	0.1	0.2	0.1	0.2	Pass
33 :	68.2	0.6	0.9	0.7	1.0	Pass
34 :	54.1	0.3	0.6	0.3	0.6	Pass
35 :	64.3	1.4	2.2	1.7	2.6	Pass
36 :	51.1	0.3	0.6	0.5	1.0	Pass
37 :	60.8	1.3	2.1	1.7	2.8	Pass
38 :	48.4	0.4	0.8	0.5	1.0	Pass
39 :	57.7	0.5	0.9	0.7	1.2	Pass
40 :	46.0	0.1	0.2	0.1	0.2	Pass

4.1.2 Voltage changes, voltage fluctuations and flicker on AC mains

General test information

Test procedure : EN 61000-3-3:2013+A1:2019+A2:2021
 Temperature : 25°C
 Relative Humidity : 51 %RH
 Test result : Pass

Block Diagram of Test Set up



Test Procedure

According to the A.10 of the EN 61000-3-3:2013+A1:2019+A2:2021:

According to the characteristics of the sample, as specified by clause 5 of the basic standard, following limits apply:

- the value of P_{st} shall not be greater than 1.0;
- the value of P_{lt} shall not be greater than 0.65;
- 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 4%.

The measurement was carried in accordance with Annex B of the basic standard and the EUT was set to produce the most unfavorable sequence of voltage changes.

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

Table 3: Voltage fluctuations and flicker measurement results

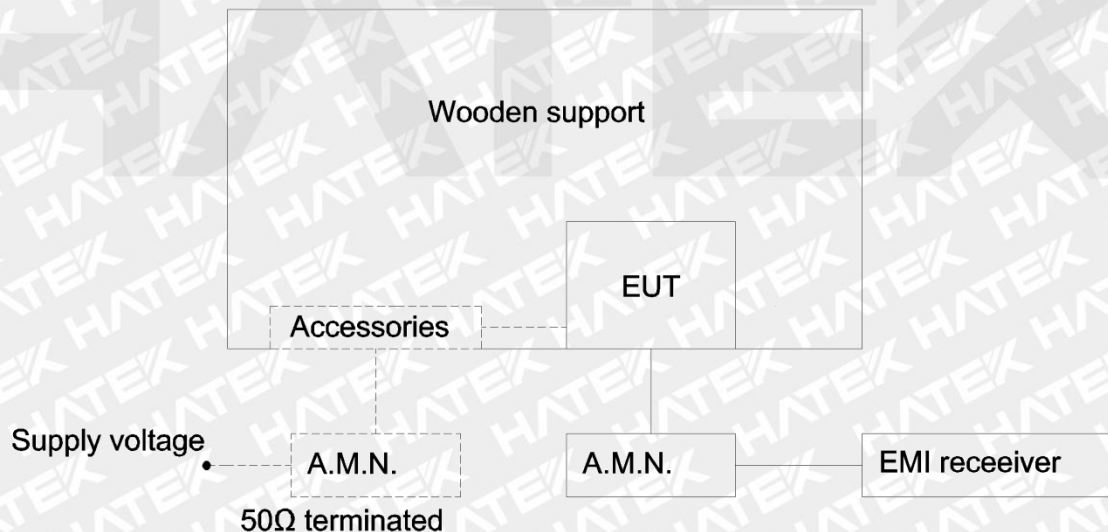
	d_c	$d_{max}(average)$	$d(t)$	P_{st}	P_{lt}
Limits	3.3%	4%	3.3%/500ms	1.0	N/A
Result	0.00 %	0.03%	0.00ms	0.006	--

4.1.3 Mains Terminal Continuous Disturbance Voltage

General test information

Test procedure : EN IEC 55014-1:2021 and CISPR 16-1 series standards
 Frequency range : 0.15-30MHz
 Kind of test site : EMC Chamber
 Temperature : 25 °C
 Relative Humidity : 51 %RH
 Operational condition : ON
 Artificial hand : Yes
 Earthing : Through artificial hand to AMN.
 Test result : Pass

Block Diagram of Test Set up



- ☒ For table top equipment, wooden support is 0.8m height.
☐ For floor standing equipment, wooden support is 0.1m height.

Test Procedure

The measurement setup was made according to EN IEC 55014-1:2021 in an EMC Chamber.

Prior to the measurements the test object operated about 15 minutes (warm-up) in order to stabilize its operating conditions and to ensure reliable measurement values.

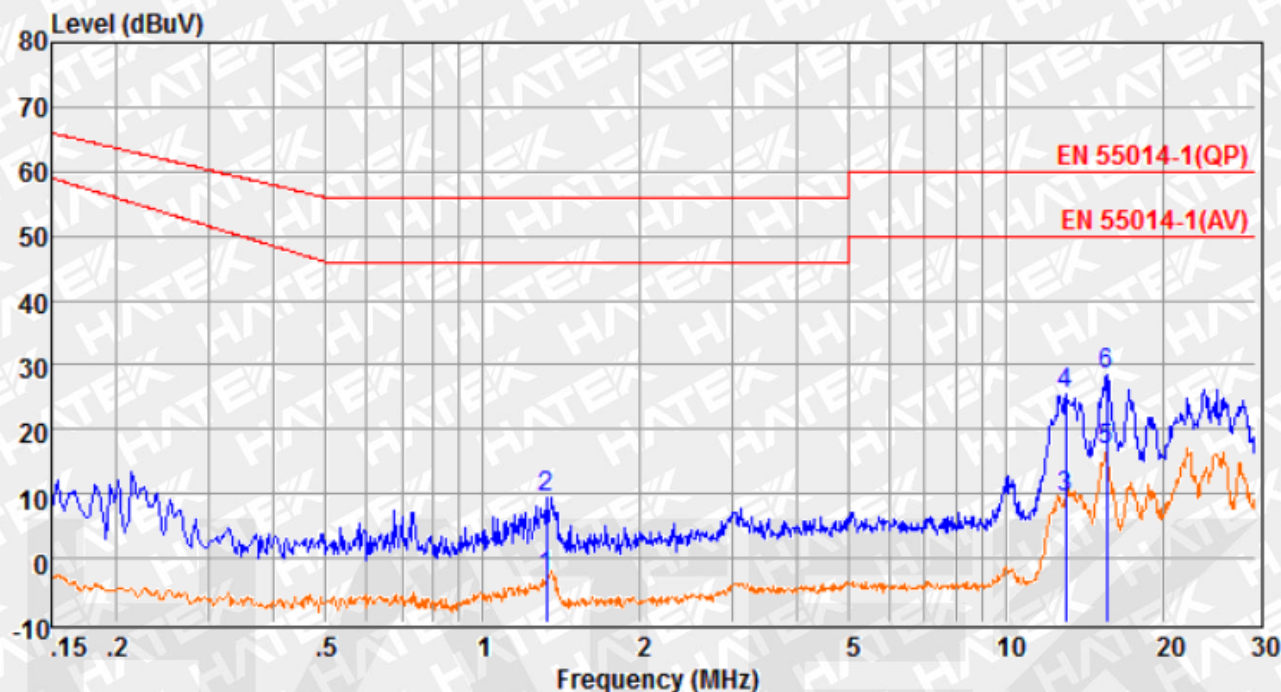
Furthermore an internal calibration with the test receiver was conducted prior to each measurement. And the measurement was made in the state the maximum disturbance was obtained.

The tested object was set-up on a wooden table. The length of the power cord of the tested object was about 1.5m. The EUT was set 0.8m away from the AMN. The cord longer than necessary to be connected to the AMN was folded forth and back parallel so as to form a bundle with a length between 0.3m and 0.4m. The EUT (Equipment under Test) was wrapped with artificial hand that was earthed through the Artificial Mains Network (AMN).

The Interference Voltage was determined according to clause 5 of EN IEC 55014-1:2021 while measuring the line and neutral conductor by turns.

In the Figures, the symbol “+” means Quasi-Peak Value and the symbol “x” means Average Value which was measured in final measurement.

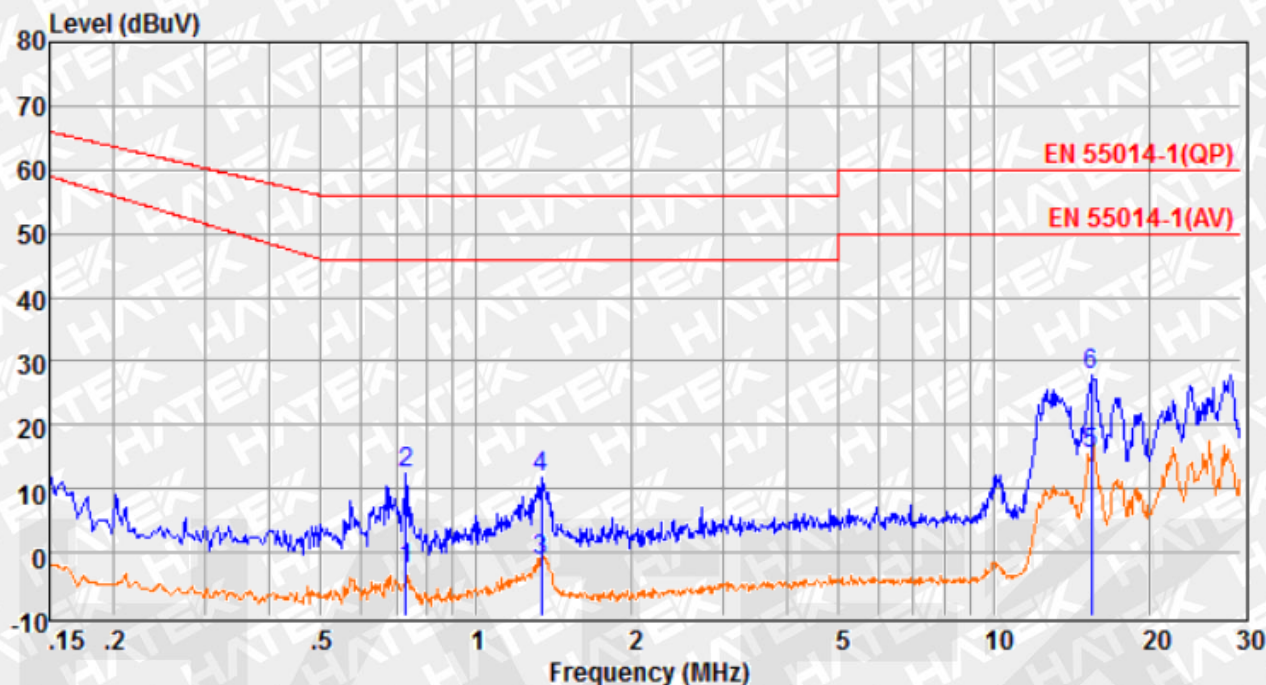
Figure 1: Test Curve of Conducted Emission in the frequency range of 150kHz - 30MHz, L line



	Freq	Reading	LisnFac	CabLos	Measured	Limit	Over	Remark
	MHz	dBpW	dB	dB	dBpW	dBpW	dB	
1	1.32	-12.69	9.59	0.12	-2.98	46.00	-48.98	Average
2	1.32	-0.20	9.59	0.12	9.51	56.00	-46.49	Peak
3	12.99	-0.88	10.01	0.15	9.28	50.00	-40.72	Average
4	12.99	15.36	10.01	0.15	25.52	60.00	-34.48	Peak
5	15.55	6.34	10.18	0.17	16.69	50.00	-33.31	Average
6	15.55	17.98	10.18	0.17	28.33	60.00	-31.67	Peak

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss.
 2. The emission levels that are 20dB below the official limit are not reported.

Figure 2: Test Curve of Conducted Emission in the frequency range of 150kHz - 30MHz, N line



	Freq	Reading	LisnFac	CabLos	Measured	Limit	Over	Remark
	MHz	dBpW	dB	dB	dBpW	dBpW	dB	
1	0.73	-12.22	9.58	0.11	-2.53	46.00	-48.53	Average
2	0.73	2.65	9.58	0.11	12.34	56.00	-43.66	Peak
3	1.34	-10.91	9.58	0.12	-1.21	46.00	-47.21	Average
4	1.34	2.15	9.58	0.12	11.85	56.00	-44.15	Peak
5	15.39	5.11	10.17	0.17	15.45	50.00	-34.55	Average
6	15.39	17.34	10.17	0.17	27.68	60.00	-32.32	Peak

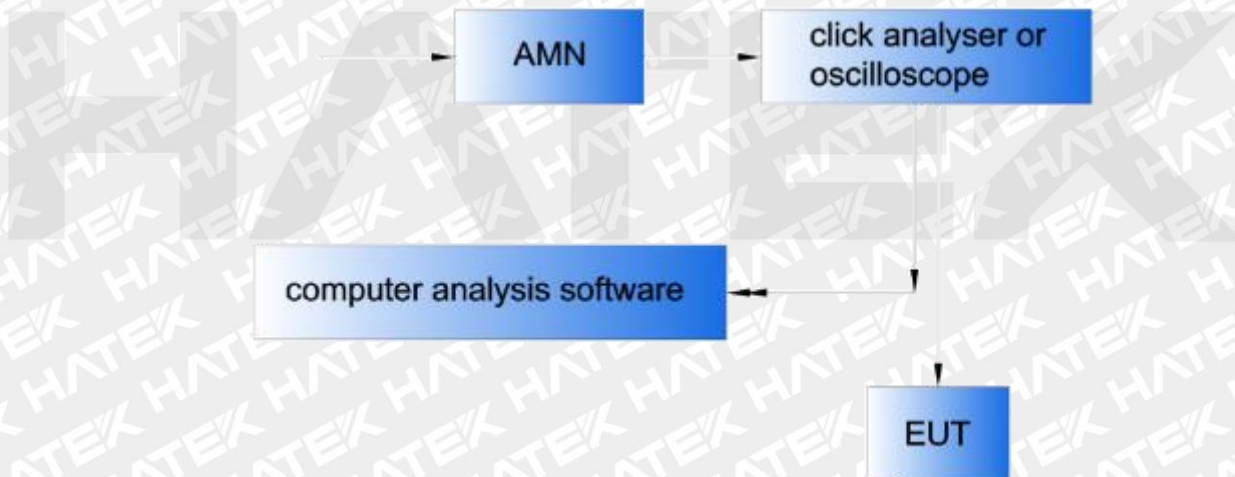
Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss.
 2. The emission levels that are 20dB below the official limit are not reported.

4.1.4 Discontinuous Interference on AC Mains

General test information

Frequency range	: 0.15-30MHz
Kind of test site	: EMC Chamber
Temperature	: 25 °C
Relative Humidity	: 51 %RH
Operational condition	: ON
Port	: Mains
Limit	: EN IEC 55014-1:2021, clause 4.4.2 (Household Appliance)
Test result	: Pass

Block Diagram of Test Set up



Test Procedure

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

The measurement setup was made according to EN IEC 55014-1:2021, clause 4.2 in an shielding room. The used measurement equipment was in accordance to CISPR 16-1 series standards.

The test setup is according to clause 5.2 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 4: Click Test Results

	150 kHz	500 kHz	1.4 MHz	30 MHz
First Run				
Short	40	0	0	0
Long	0	0	0	0
Long (10< t ≤20 ms)	0	0	0	0
Tot. Clicks Corr	40	0	0	0
Events	0	0	0	0
Time(s)	0.00	0.00	0.00	0.00
Sw.Op.	0	0	0	0
4.2.3.4 events	0	0	0	0
Limit dBuV	66	56	56	60
N	0.63	0.00	0.00	0.00
	PASS	PASS	PASS	PASS

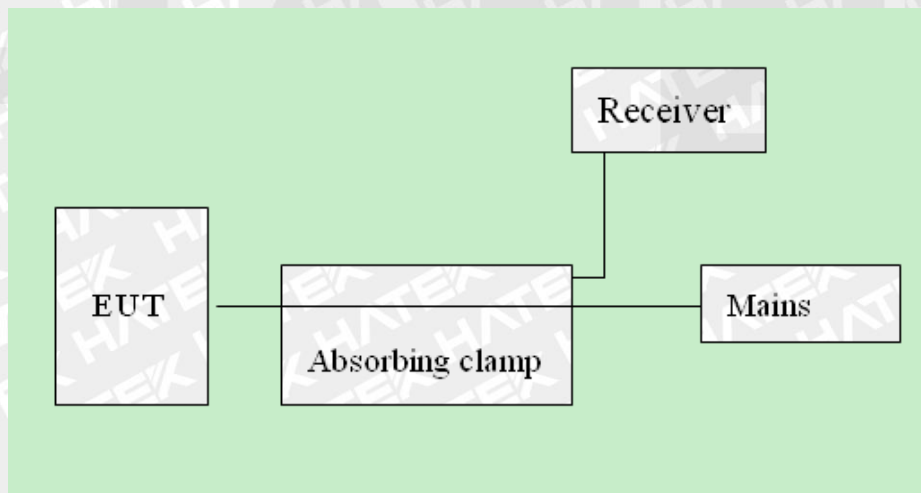
4.2 Emission in the Frequency Range from 30 MHz to 1000 MHz

4.2.1 Disturbance Power on Mains

General test information

Frequency Range	: 30 – 300MHz
Kind of test site	: EMC Chamber
Temperature	: 25 °C
Relative Humidity	: 51 %RH
Operational condition	: ON
Port	: Mains
Limit	: EN IEC 55014-1:2021, clause 4.1.2.1, Household and similar appliances
Test result	: Pass

Block Diagram of Test Set up



- ☒ For table top equipment, wooden support is 0.8m height.
- ☐ For floor standing equipment, wooden support is 0.1m height.

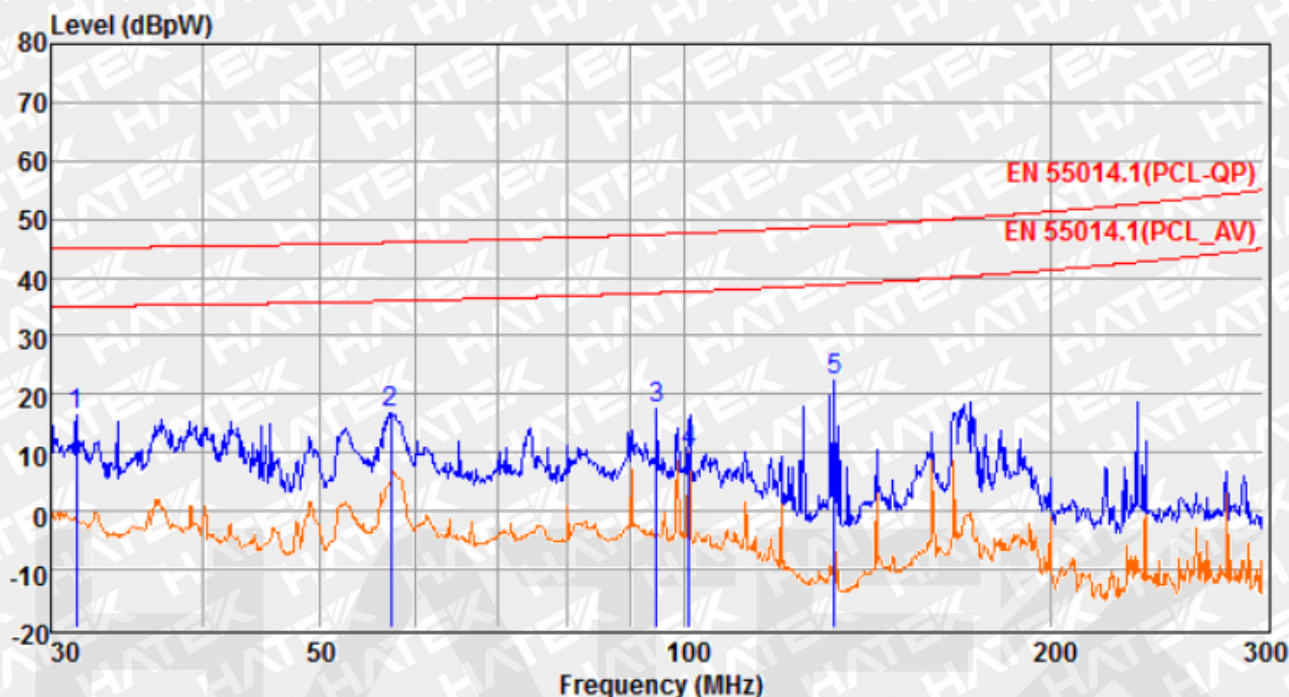
Test Procedure

Furthermore an internal calibration with the test receiver was conducted prior to each measurement.

The tested object was set-up on a wooden bench. The length of the power cord of the test object was about 1.5m. The length of power cord of EUT plus that of the extension cord was approximately 6.0m.

In the Figures, the symbol “+” means Quasi-Peak Value and the symbol “x” means Average Value which was measured in final measurement.

Figure 3: Test Curve of Power Disturbance in the frequency range of 30–300MHz, AC line



	Freq	Reading	LisnFac	CabLos	Measured	Limit	Over	Remark
	MHz	dBpW	dB	dB	dBpW	dBpW	dB	
1	31.49	-6.48	2.89	19.88	16.29	45.07	-28.78	Peak
2	57.16	-7.05	3.45	20.45	16.85	46.02	-29.17	Peak
3	94.87	-6.26	3.35	20.35	17.44	47.41	-29.97	Peak
4	100.72	-12.86	3.08	20.08	10.30	37.63	-27.33	Average
5	132.78	7.20	-0.93	16.06	22.33	48.82	-26.49	Peak

Remarks: 1. Measured = Reading + Lisn Factor +Cable Loss.
 2. The emission levels that are 20dB below the official limit are not reported.

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: Apparatus containing no electronic control circuitry, for example motor operated appliances, toys, tools, heating appliances and similar apparatus (such as UV and IR radiators).”

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

According to clause 7.2.1 of EN IEC 55014-2:2021, the EUT is deemed to fulfill the relevant immunity requirements without actual testing.

6 Photographs of the EUT

Photograph 1: Set-up for Disturbance Voltage



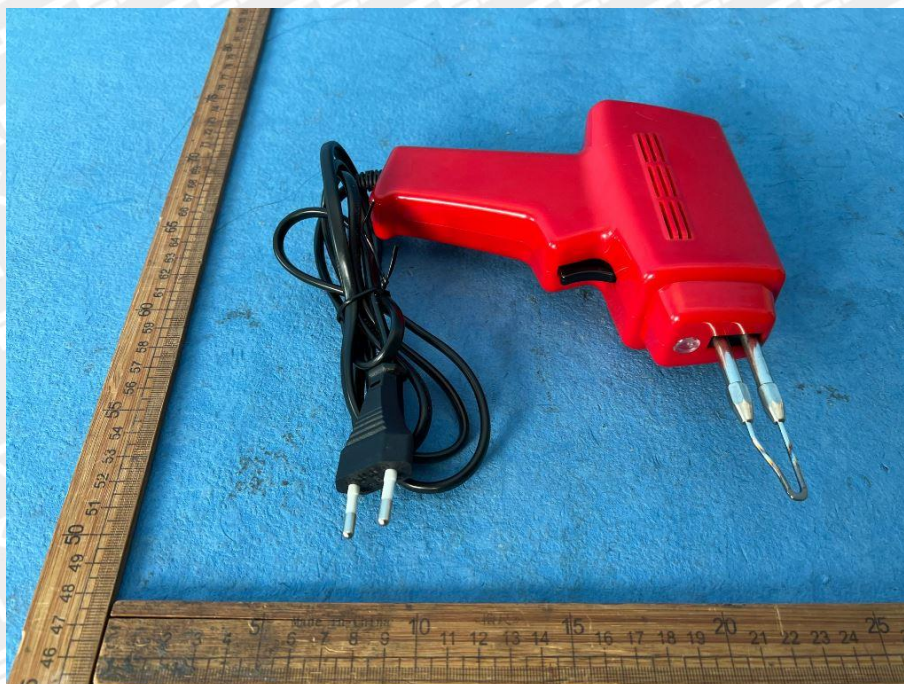
Photograph 2: Set-up for Disturbance Power



Photograph 3: Overall view of EUT (ZD-507(150W))



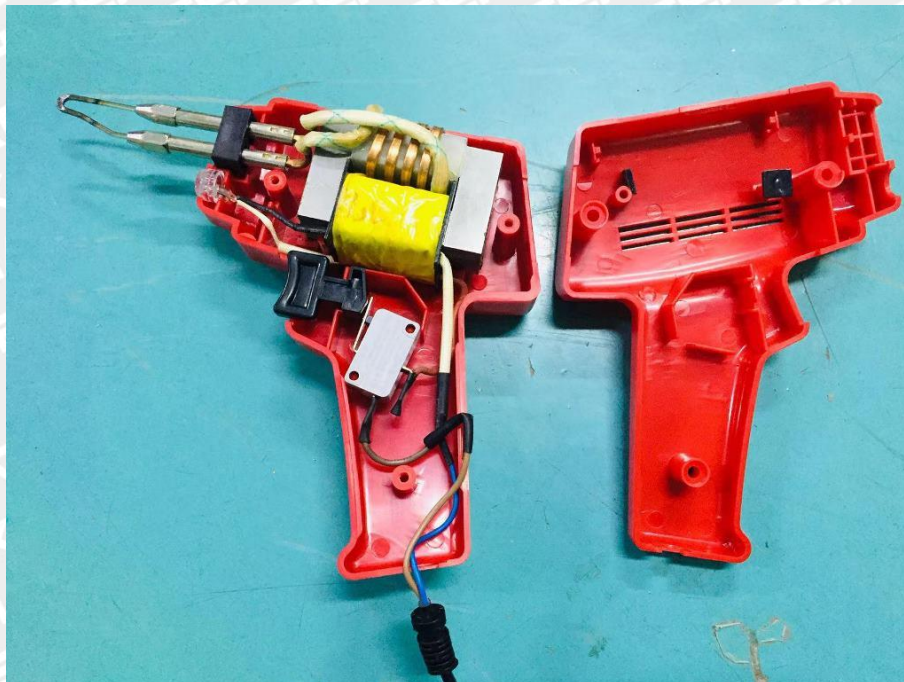
Photograph 4: Overall view of EUT (ZD-507(150W))



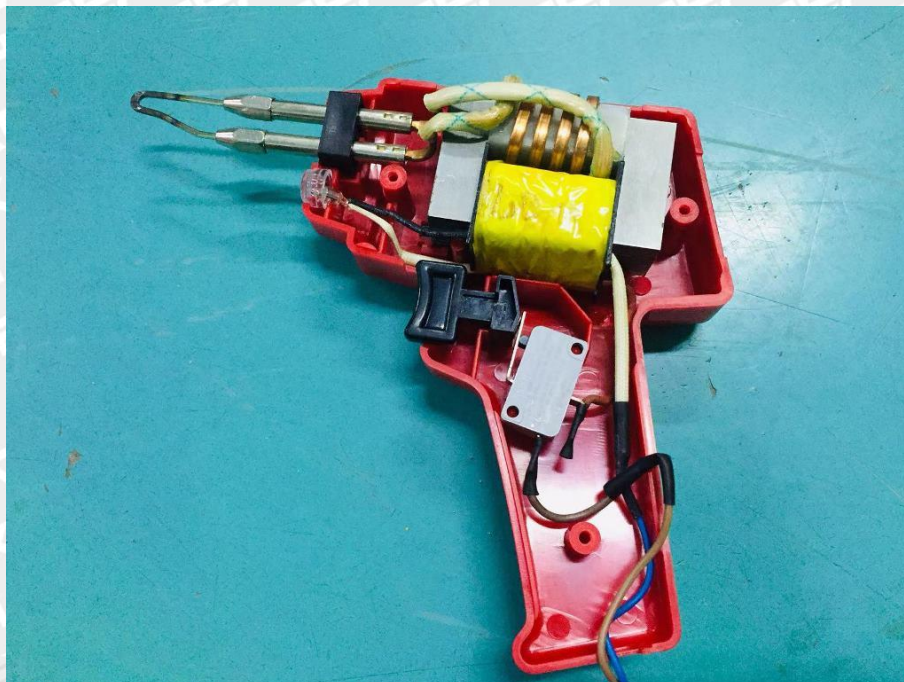
Photograph 5: Overall view of EUT (ZD-507(150W))



Photograph 6: Internal view of EUT (ZD-507(150W))



Photograph 7: Internal view of EUT (ZD-507(150W))



Photograph 8: Overall view of EUT (ZD-507M(150W))



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