



**EUROFINS ELECTRICAL TESTING SERVICE (SHANGHAI) CO., LTD.**

# **EMC TEST- REPORT**

**TEST REPORT NUMBER: EFSH24120254-IE-02-E01**



Eurofins Electrical Testing Service (Shanghai) Co., Ltd.  
Building 18, No.2168 Chenhang Highway, Minhang District,  
Shanghai, China

Phone: +86-21-36202800  
Fax: +86-21-61819180  
Page 1 of 23

## TABLE OF CONTENTS

<b>1</b>	<b>Contents</b>	
<b>1</b>	<b>Contents</b>	<b>2</b>
<b>2</b>	<b>General Information</b>	<b>3</b>
2.1	Notes	3
2.2	Testing laboratory	4
2.3	Details of approval holder	5
2.4	Application details	5
2.5	EUT information	5
2.6	Test standards	5
<b>3</b>	<b>Technical test</b>	<b>6</b>
3.1	Summary of test results	6
3.2	Test environment	6
3.3	Test mode	6
3.4	Test equipment utilized	7
3.5	Test results	8
<b>4</b>	<b>Emission Test</b>	<b>9</b>
4.1	Conducted Emission	9
4.2	Disturbance power	12
4.3	Harmonic Current Emissions	14
4.4	Voltage Changes, Voltage Fluctuations and Flicker	18
<b>5</b>	<b>Immunity Test</b>	<b>19</b>
5.1	Performance Criteria Description in Clause 6 of EN IEC 55014-2	19
5.2	Classification of apparatus	19
<b>6</b>	<b>Test Setup Photos</b>	<b>20</b>
<b>7</b>	<b>EUT Photos</b>	<b>22</b>

## 2 General Information

### 2.1 Notes

The results of this test report relate exclusively to the item tested as specified in chapter "Description of test item" and are not transferable to any other test items.

Eurofins Electrical Testing Service (Shanghai) Co., Ltd. is not responsible for any generalisations and conclusions drawn from this report. Any modification of the test item can lead to invalidity of test results and this test report may therefore be not applicable to the modified test item.

The test report may only be reproduced or published in full. Reproducing or publishing extracts of the report requires the prior written approval of the Eurofins Electrical Testing Service (Shanghai) Co., Ltd.

This document is subject to the General Terms and Conditions and the Testing and Certification System of Eurofins Electrical Testing Service (Shanghai) Co., Ltd., available on request or accessible at <https://www.eurofins.cn/en/eurofins-consumer-product-testing-china/resource-centre/general-terms/>.

#### Operator:

2024-12-23

Crystal Liu/ Project Engineer



Date

Eurofins-Lab.

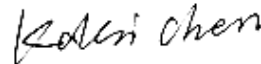
Name / Title

Signature

#### Technical responsibility for area of testing:

2024-12-23

Kalsi Chen / Supervisor



Date

Eurofins

Name / Title

Signature

Test Report No.: EFSH24120254-IE-02-E01

Eurofins Electrical Testing Service (Shanghai) Co., Ltd.  
Building 18, No.2168 Chenhang Highway, Minhang District, Shanghai, China

## 2.2 Testing laboratory

### **Eurofins Electrical Testing Service (Shanghai) Co., Ltd.**

Building 18, No.2168 Chenhang Highway, Minhang District, Shanghai, China

Telephone : +86-21-36202800

Telefax : +86-21-61819180

#### **Test location, where different:**

Subcontractor

Name : **TÜV Rheinland (Shanghai) Co.. Ltd.**

Address : B1-13/F No.177, Lane 777, West Guangzhong Road, Jing'an District. Shanghai 200072, P.R. China

Telephone : ./.

Fax : ./.

All tests were performed at Subcontractor.

---

Test Report No.: EFSH24120254-IE-02-E01

---

Eurofins Electrical Testing Service (Shanghai) Co., Ltd.  
Building 18, No.2168 Chenhang Highway, Minhang District, Shanghai, China

## 2.3 Details of approval holder

Name : **Ningbo Deli Tools Co., Ltd.**  
Address : No.128, Chezhan West Road, Huangtan Town, Ninghai County,  
Ningbo, Zhejiang, China  
Telephone : ./.  
Fax : ./.

## 2.4 Application details

Date of receipt of test item : 2024-12-19  
Date of test : 2013-03-12  
Date of re-evaluation : 2024-12-23

## 2.5 EUT information

Product type : Spray gun  
Model name : DC090, DC090-X, EDC090, EDC090-X  
Brand name : Deli  
Serial number : ./.  
Ratings : 220V-240V 50/60Hz 450W  
Test voltage : 230V~, 50Hz  
Additional information :  
The EUT covered in the report is Spray gun.  
All models are identical except the model names.

After review, models DC090 were selected to full tests and the most unfavorable data was recorded.

## 2.6 Test standards

Technical standard :

**EN IEC 55014-1: 2021**

**EN IEC 55014-2: 2021**

**EN IEC 61000-3-2: 2019+A1: 2021+A2: 2024**

**EN 61000-3-3: 2013+A1: 2019+A2: 2021**

### 3 Technical test

#### 3.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed.



or

The deviations as specified were ascertained in the course of the tests performed.



**Remark:**

This test report is based on original report ref. No. 15058292 001-007&009 and 15058292 011 with following similarities/differences:

Model DC090 in this report is corresponding to model JS-PHA2520 in original report with different model names, Ratings and brand.

The approval holder is “**Ningbo Deli Tools Co., Ltd.**” located at “No.128, Chezhan West Road, Huangtan Town, Ninghai County, Ningbo, Zhejiang, China”.  
Update technical standard.

After review, no additional tests need to be done. The result of compliance remains effective.

#### 3.2 Test environment

Temperature	:	20	...	25°C
Relative humidity content	:	30	...	60%
Air pressure	:	100	...	103kPa

#### 3.3 Test mode

Operating (Max. level)

---

Test Report No.: EFSH24120254-IE-02-E01

Eurofins Electrical Testing Service (Shanghai) Co., Ltd.  
Building 18, No.2168 Chenhang Highway, Minhang District, Shanghai, China

### 3.4 Test equipment utilized

Refer to the latest test date: 2013-03-12

No.	Equipment	Model	Serial no.	Cal. due date
1	Harmonic emission/voltage fluctuation and flicker test system	Proflin 2105-400-413-LNS	55907, 72292	05.03.2013
2	EMI test receiver	ESIB26	100227	21.05.2013
3	Absorbing clamp	AMZ 41	20356	31.03.2013
4	Artificial mains network	NNB 42	04/10048	15.02.2013

---

Test Report No.: EFSH24120254-IE-02-E01

Eurofins Electrical Testing Service (Shanghai) Co., Ltd.  
Building 18, No.2168 Chenhang Highway, Minhang District, Shanghai, China

### 3.5 Test results

☒ 1st test

☐ test after modification

☐ production test

Test case	Subclause	Required	Test passed	Test failed
Conducted Emission	Clause 4.3.2 & 4.3.3 of EN IEC 55014-1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Disturbance power	Clause 4.3.4 of EN IEC 55014-1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Radiated disturbance	Clause 4.3.4 of EN IEC 55014-1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated disturbance (1GHz to 6GHz)	Clause 4.3.5 of EN IEC 55014-1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Magnetic field (equipment using IPT)	Clause 4.3.2 of EN IEC 55014-1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Discontinuous disturbance	Clause 4.4.2 of EN IEC 55014-1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Harmonic Current Emissions	EN IEC 61000-3-2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Voltage Changes, Voltage Fluctuations and Flicker	EN 61000-3-3	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Electrostatic Discharge	Clause 5.1 of EN IEC 55014-2 & IEC 61000-4-2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Electrical Fast Transients	Clause 5.2 of EN IEC 55014-2 & IEC 61000-4-4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Injected currents	Clause 5.3 & 5.4 of EN IEC 55014-2 & IEC 61000-4-6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radio frequency electromagnetic fields	Clause 5.5 of EN IEC 55014-2 & IEC 61000-4-3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Surges	Clause 5.6 of EN IEC 55014-2 & IEC 61000-4-5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Voltage dips	Clause 5.7 of EN IEC 55014-2 & IEC 61000-4-11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note 1: The additional margin (0-10dB) was met in the frequency range 200MHz to 300MHz in Disturbance power test (absorbing clamp), and the EUT did not contain any circuit with clock frequency more than 30MHz, so the EUT was compliant with the Radiated disturbance test (300MHz-1GHz) without test.

Note 2: Radiated disturbance test in the frequency range from 1 GHz to 6 GHz is not required as the highest clock frequency (F<sub>x</sub>) of EUT is less than 108MHz.

Note 3: The click rate was less than 5, and the click duration was less than 10ms. So, it is deemed to comply with Discontinuous disturbance test.

Note 4: Category I apparatus is deemed to fulfil the relevant immunity requirements without testing.

Test Report No.: EFSH24120254-IE-02-E01

Eurofins Electrical Testing Service (Shanghai) Co., Ltd.  
Building 18, No.2168 Chenhang Highway, Minhang District, Shanghai, China

Page 8 of 23



## 4 Emission Test

### 4.1 Conducted Emission

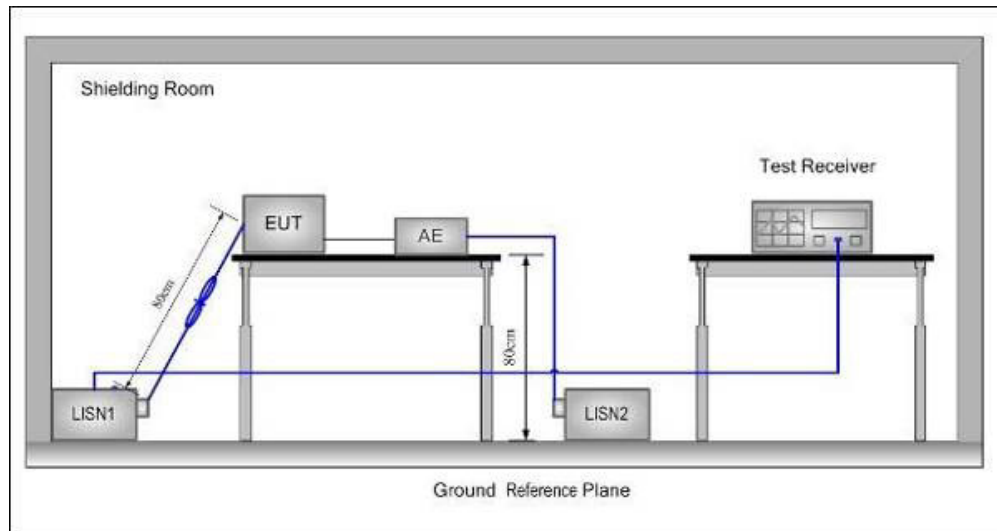
This clause lays down the general requirements for the measurement of disturbance voltage produced at the terminals of apparatus.

#### 4.1.1 Limits

Frequency	Rated motor power not exceeding 700W		Rated motor power above 700 W and not exceeding 1 000 W		Rated motor power above 1000W	
(MHz)	dB (μV) Quasi-peak	dB (μV) Average	dB (μV) Quasi-peak	dB (μV) Average	dB (μV) Quasi-peak	dB (μV) Average
0.15 to 0.35	66 to 59	59 to 49	70 to 63	63 to 53	76 to 69	69 to 59
0.35 to 5	59	49	63	53	69	59
5 to 30	64	54	68	58	74	64

Decreasing linearly with the logarithm of the frequency from.  
If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.

#### 4.1.2 Measurement procedure



1. The mains terminal disturbance voltage was measured with the EUT in a shielded room.
2. The EUT was connected to AC power source through a LISN (Line Impedance Stabilization Network) which provides a  $(50 \mu H + 5 \Omega) \parallel 50 \Omega$  linear impedance. The power cables of all other units of the EUT were connected to a second LISN, which was bonded to the ground reference plane in the same way as the LISN for the unit being measured.
3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane but separated from metallic contact with the ground reference plane by 0.1m of insulation.

Test Report No.: EFSH24120254-IE-02-E01

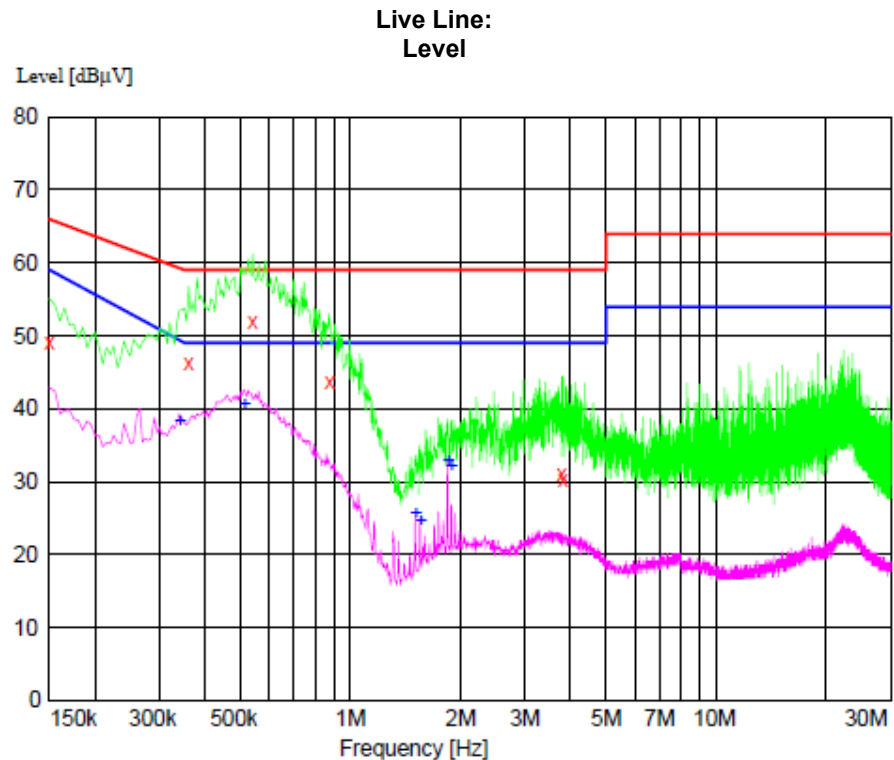
Eurofins Electrical Testing Service (Shanghai) Co., Ltd.  
Building 18, No.2168 Chenhang Highway, Minhang District, Shanghai, China

4. Before get the final emission results with quasi-peak (QP) detector and average (AVG) detector, a pre-scan was performed with the peak(PK) and average(AVG) detector to find out the maximum emission data plots of the EUT.

#### 4.1.3 Measurement uncertainty

Ulab(cond) = 3.32dB at 95% level of confidence, k=2

#### 4.1.4 Results -Measurement Data



Final quasi-peak measurement results:

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line
0.150000	49.20	19.9	66.0	16.8	L1
0.360000	46.20	19.8	59.0	12.8	L1
0.540000	52.00	19.8	59.0	7.0	L1
0.880000	43.60	19.7	59.0	15.4	L1
3.785000	31.10	19.9	59.0	27.9	L1
3.820000	30.30	19.9	59.0	28.7	L1

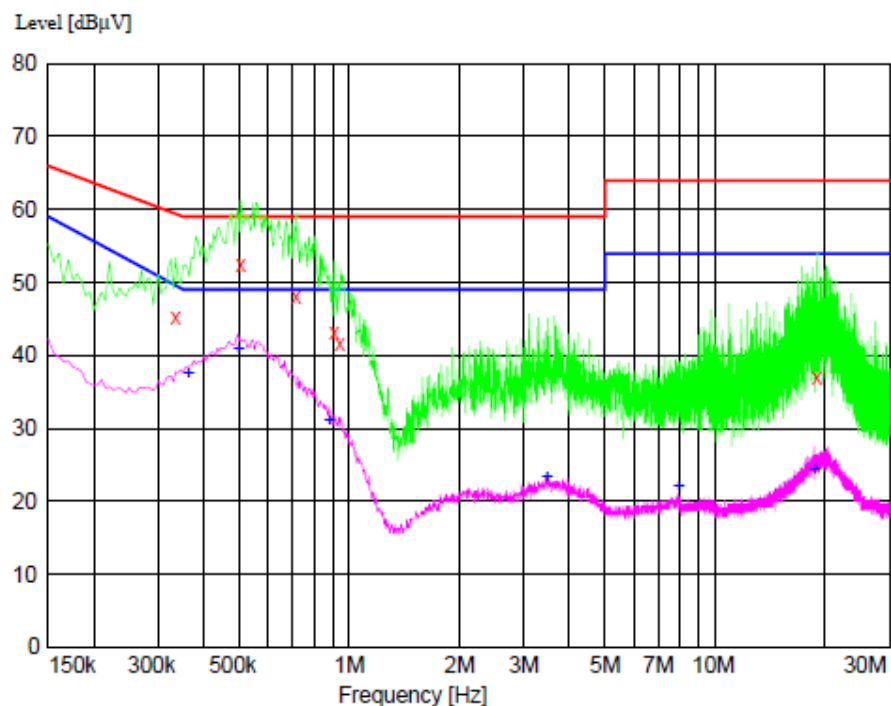
Final average measurement results:

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line
0.340000	38.20	19.8	49.3	11.1	L1
0.510000	40.50	19.8	49.0	8.5	L1
1.500000	25.60	19.8	49.0	23.4	L1
1.550000	24.60	19.8	49.0	24.4	L1
1.840000	32.90	19.8	49.0	16.1	L1
1.885000	32.00	19.8	49.0	17.0	L1

Test Report No.: EFSH24120254-IE-02-E01

Eurofins Electrical Testing Service (Shanghai) Co., Ltd.  
Building 18, No.2168 Chenhang Highway, Minhang District, Shanghai, China

# Neutral Line: Level



## Final quasi-peak measurement results:

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line
0.335000	45.20	19.5	59.4	14.1	N
0.505000	52.50	19.6	59.0	6.5	N
0.715000	48.20	19.5	59.0	10.8	N
0.910000	43.20	19.5	59.0	15.8	N
0.945000	41.70	19.5	59.0	17.3	N
19.055000	36.90	21.7	64.0	27.1	N

## Final average measurement results:

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line
0.360000	37.60	19.5	49.0	11.4	N
0.495000	40.90	19.6	49.0	8.1	N
0.880000	31.20	19.5	49.0	17.8	N
3.465000	23.30	19.9	49.0	25.7	N
7.915000	21.90	20.6	54.0	32.1	N
18.675000	24.40	21.7	54.0	29.6	N

Test Report No.: EFSH24120254-IE-02-E01

Eurofins Electrical Testing Service (Shanghai) Co., Ltd.  
Building 18, No.2168 Chenhang Highway, Minhang District, Shanghai, China

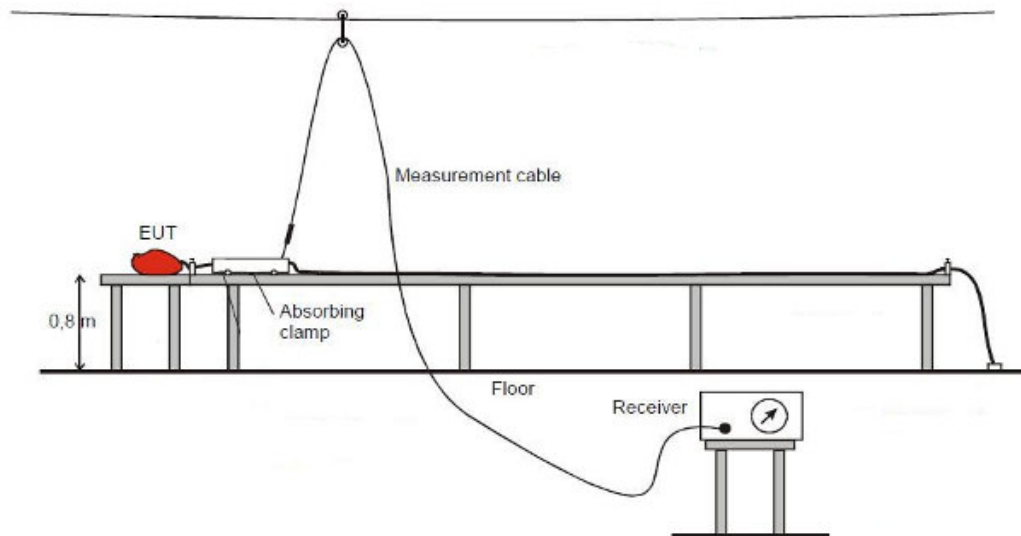
## 4.2 Disturbance power

This clause lays down the general requirements for the measurement of disturbance power produced at the terminals of apparatus.

### 4.2.1 Limits

Household and similar appliances			Tools					
1	2	3	4	5	6	7	8	9
Frequency			Rated motor power not exceeding 700W		Rated motor power above 700W and not exceeding 1000W		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
30 to 300	45 to 55	35 to 45	45 to 55	35 to 45	49 to 59	39 to 49	55 to 65	45 to 55
Increasing linearly with the frequency from. If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.								

### 4.2.2 Measurement procedure



The test configuration corresponds to the standard. The equipment under test is placed on a non-metallic table with 0,8 m high. The lead to be measured is stretched horizontally in a straight line, to permit variation in position of the absorbing clamp along the lead to find the maximum indication. The lead shall be at least length of 6 meter. Before get the final emission results with quasi-peak(QP) detector and average(AVG) detector, a pre-scan was performed with the peak(PK) detector to find out the maximum emission data plots of the EUT. The absorbing clamp is placed around the lead.

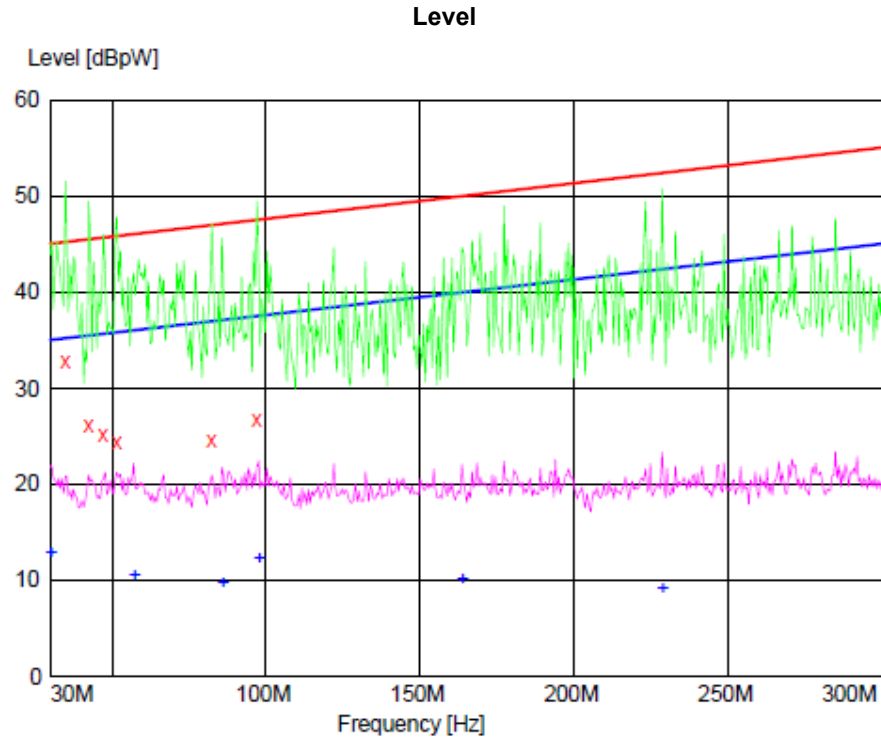
Test Report No.: EFSH24120254-IE-02-E01

Eurofins Electrical Testing Service (Shanghai) Co., Ltd.  
Building 18, No.2168 Chenhang Highway, Minhang District, Shanghai, China

#### 4.2.3 Measurement uncertainty

U<sub>lab(cond)</sub> = 4.16 dB at confidence of 95%, k=2

#### 4.2.4 Results



Final quasi-peak measurement results:

Frequency MHz	Level dBpW	Transd dB	Limit dBpW	Margin dB
34.869739	32.90	6.9	45.2	12.2
42.444890	26.10	5.9	45.5	19.3
47.314629	25.10	6.1	45.6	20.6
51.643287	24.50	6.2	45.8	21.4
82.484970	24.70	4.9	46.9	22.3
97.094188	26.70	5.3	47.5	20.7

Final average measurement results:

Frequency MHz	Level dBpW	Transd dB	Limit dBpW	Margin dB
30.000000	12.80	8.5	35.0	22.2
57.054108	10.40	5.6	36.0	25.6
85.731463	9.70	4.9	37.1	27.3
97.635271	12.20	5.3	37.5	25.3
163.647295	10.00	3.5	39.9	30.0
228.577154	9.10	3.5	42.4	33.3

Test Report No.: EFSH24120254-IE-02-E01

Eurofins Electrical Testing Service (Shanghai) Co., Ltd.  
Building 18, No.2168 Chenhang Highway, Minhang District, Shanghai, China

### 4.3 Harmonic Current Emissions

This part deals with the limitation of harmonic currents injected into the public supply system.

#### 4.3.1 Limits

**Table 1 – Limits for Class A equipment**

Harmonic order $h$	Maximum permissible harmonic current A
<b>Odd harmonics</b>	
3	2,30
5	1,14
7	0,77
9	0,40
11	0,33
13	0,21
$15 \leq h \leq 39$	$0,15 \frac{15}{h}$
<b>Even harmonics</b>	
2	1,08
4	0,43
6	0,30
$8 \leq h \leq 40$	$0,23 \frac{8}{h}$

**Table 2 – Limits for Class C equipment <sup>a</sup>**

Harmonic order $h$	Maximum permissible harmonic current expressed as a percentage of the input current at the fundamental frequency %
2	2
3	27 <sup>b</sup>
5	10
7	7
9	5
$11 \leq h \leq 39$ (odd harmonics only)	3
<sup>a</sup> For some Class C products, other emission limits apply (see 7.4). <sup>b</sup> The limit is determined based on the assumption of modern lighting technologies having power factors of 0,90 or higher.	

**Table 3 – Limits for Class D equipment**

Harmonic order $h$	Maximum permissible harmonic current per watt mA/W	Maximum permissible harmonic current A
3	3,4	2,30
5	1,9	1,14
7	1,0	0,77
9	0,5	0,40
11	0,35	0,33
$13 \leq h \leq 39$ (odd harmonics only)	$\frac{3,85}{h}$	See Table 1

**Limits for Class A equipment:**

For Class A equipment, the harmonics of the input current shall not exceed the values given in Table 1

**Limits for Class B equipment:**

For Class B equipment, the harmonics of the input current shall not exceed the values given in Table 1 multiplied by a factor of 1,5.

**Limits for Class C equipment:**

Rated power > 25 W:

For luminaires with incandescent lamps and built-in phase control dimming having a rated power greater than 25W, the harmonics of the input current shall not exceed the limits given in Table 1.

For any other lighting equipment having a rated power greater than 25W, the harmonics of the input current shall not exceed the relative limits given in Table 2.

Rated power  $\geq 5$  W and  $\leq 25$  W:

Lighting equipment having a rated power greater than or equal to 5 W and less than or equal to 25 W shall comply with one of the following three sets of requirement:

- The harmonic currents shall not exceed the power-related limits of Table 3, column 2.

Or

- The third harmonic current, expressed as a percentage of the fundamental current, shall not exceed 86 % and the fifth harmonic current shall not exceed 61 %. In addition, the waveform of the input current shall be such that it reaches the 5 % current threshold before or at 60°, has its peak value before or at 65° and does not fall below the 5 % current threshold before 90°, referenced to any zero crossing of the fundamental supply voltage. The current threshold is 5 % of the highest absolute peak value that occurs in the measurement window, and the phase angle measurements are made on the cycle that includes this absolute peak value.

Or

- The THD shall not exceed 70%. The third order harmonic current, expressed as a percentage of the fundamental current, shall not exceed 35%, the fifth order current shall not exceed 25%, the seventh order current shall not exceed 30%, the ninth and eleventh order currents shall not exceed 20% and the second order current shall not exceed 5%.

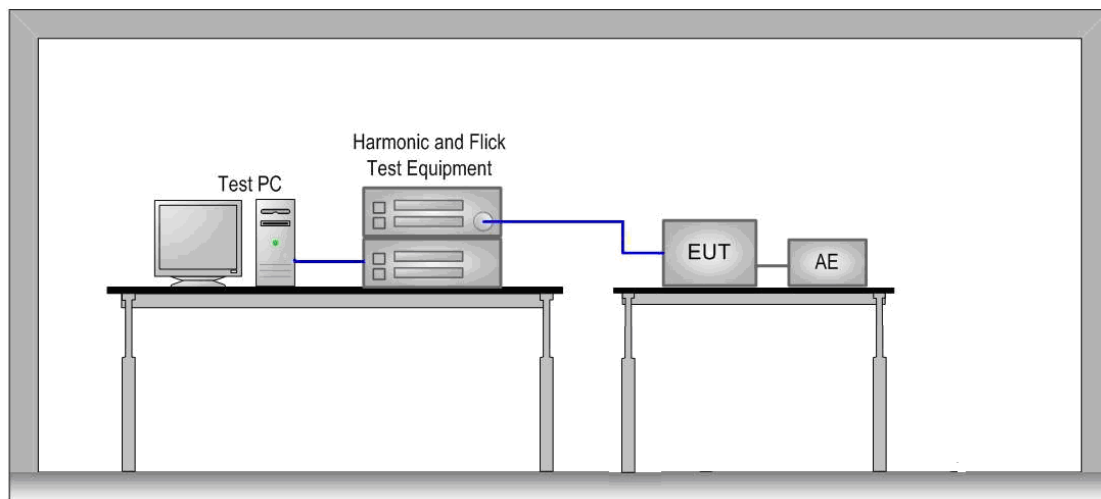
**Limits for Class D equipment:**

For Class D equipment, the input current at harmonic frequencies shall not exceed the values given in Table 3.

**For the following categories of equipment, limits are not specified:**

- Lighting equipment with a rated power less than but not equal to 5W;
- Equipment with rated power of 75 W or less, other than lighting equipment;
- Professional equipment with a total rated power greater than 1 kW;
- Independent phase control dimmers with a rated power less than or equal to 1 kW when operating incandescent lamps, or with a rated power less than or equal to 200 W for trailing edge dimmers when operating lighting equipment other than incandescent lamps, or with a rated power less than or equal to 100 W for leading edge dimmers when operating lighting equipment other than incandescent lamps.

#### 4.3.2 Measurement procedure



The equipment under test is placed on a wooden table with a height of 0,8 m in the EMC lab.

For each harmonic order, measure the 1,5 s smoothed RMS harmonic current in each DFT time window and calculate the arithmetic average of the measured values from the DFT time windows, over the entire observation period.

The average values for the individual harmonic currents, taken over the entire test observation period shall be less than or equal to the applicable limits.

For each harmonic order, all 1.5 s smoothed RMS harmonic current values shall be either:

- a) Less than or equal to 150% of the applicable limits, or
- b) Less than or equal to 200% of the applicable limits under the following conditions:
  - 1) The EUT belongs to Class A for harmonics,
  - 2) The excursion beyond 150% of the applicable limits lasts less than 10% of the test observation period or in total 10 min, whichever is smaller, and
  - 3) The average value of the harmonic current, taken over the entire test observation period, is less than 90% of the applicable limits.



#### 4.3.3 Results

##### Harmonics – Class-B

Equipment category: Class B; Test voltage: AC 229.40V, 50Hz

Fundamental current I<sub>1</sub>: 1.479A; Power factor: 0.993; Active input power: 249.2W.

Harmonic order	Result (avg.) (A)	100% limit (A)	Result (max.) (A)	150% limit (A)	Result
2	0.001	1.620	0.002	2.430	Pass
3	0.121	3.450	0.125	5.175	Pass
4	0.001	0.645	0.001	0.968	Pass
5	0.011	1.710	0.011	2.565	Pass
6	0.001	0.450	0.001	0.675	Pass
7	0.003	1.155	0.004	1.733	Pass
8	0.000	0.345	0.000	0.518	Pass
9	0.001	0.600	0.002	0.900	Pass
10	0.000	0.276	0.001	0.414	Pass
11	0.000	0.495	0.001	0.743	Pass
12	0.001	0.230	0.002	0.344	Pass
13	0.001	0.315	0.001	0.473	Pass
14	0.001	0.197	0.001	0.296	Pass
15	0.000	0.225	0.000	0.338	Pass
16	0.000	0.173	0.000	0.259	Pass
17	0.000	0.199	0.000	0.297	Pass
18	0.000	0.153	0.000	0.230	Pass
19	0.000	0.178	0.000	0.266	Pass
20	0.000	0.138	0.001	0.207	Pass
21	0.000	0.161	0.001	0.241	Pass
22	0.000	0.125	0.001	0.188	Pass
23	0.001	0.147	0.001	0.220	Pass
24	0.001	0.115	0.001	0.173	Pass
25	0.011	0.135	0.012	0.203	Pass
26	0.001	0.106	0.003	0.159	Pass
27	0.011	0.125	0.011	0.188	Pass
28	0.001	0.099	0.001	0.148	Pass
29	0.001	0.116	0.002	0.175	Pass
30	0.000	0.092	0.000	0.138	Pass
31	0.000	0.110	0.000	0.163	Pass
32	0.000	0.086	0.000	0.129	Pass
33	0.000	0.102	0.000	0.153	Pass
34	0.000	0.081	0.000	0.122	Pass
35	0.000	0.096	0.000	0.145	Pass
36	0.000	0.077	0.000	0.115	Pass
37	0.000	0.092	0.000	0.137	Pass
38	0.000	0.073	0.000	0.109	Pass
39	0.000	0.087	0.000	0.130	Pass
40	0.000	0.069	0.000	0.104	Pass

Test Report No.: EFSH24120254-IE-02-E01

Eurofins Electrical Testing Service (Shanghai) Co., Ltd.  
Building 18, No.2168 Chenhang Highway, Minhang District, Shanghai, China

#### 4.4 Voltage Changes, Voltage Fluctuations and Flicker

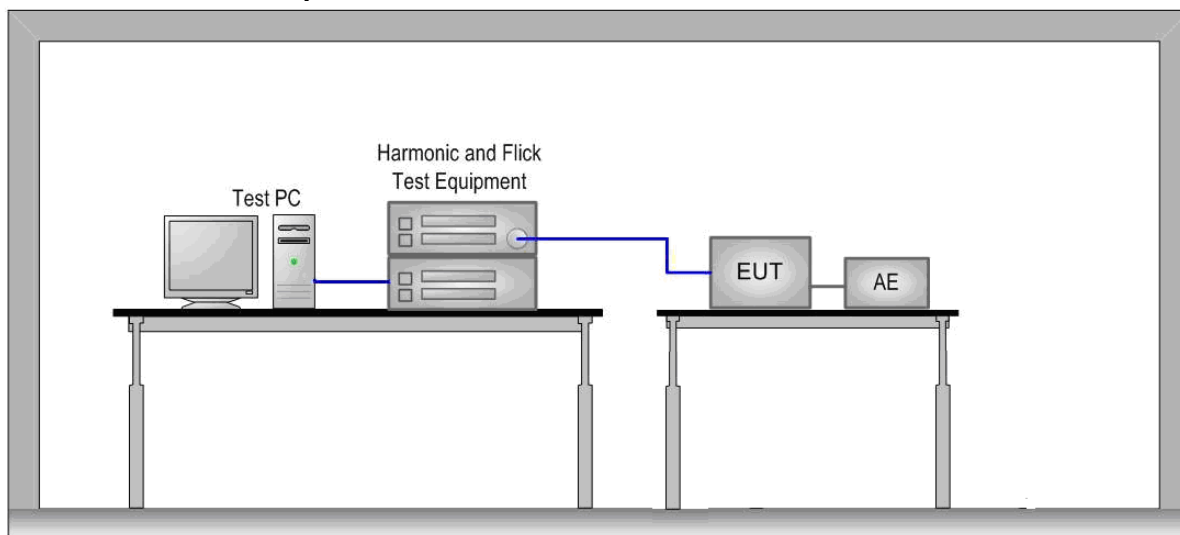
This part is concerned with the limitation of voltage fluctuations and flicker impressed on the public low-voltage system.

##### 4.4.1 Limits

Value	Limit
P <sub>st</sub>	1,0
P <sub>lt</sub>	0,65
d <sub>t</sub>	3,3%
d <sub>c</sub>	3,3%
d <sub>max</sub>	7,0%

Note: P<sub>st</sub> and P<sub>lt</sub> requirements shall not be applied to voltage changes caused by manual switching. The EUT is an equipment which is attended whilst in use.

##### 4.4.2 Measurement test procedure



The equipment under test is placed on a wooden table with a height of 0,8 m in the EMC lab. The voltage fluctuations and flicker were measured at the supply terminals of the EUT.

##### 4.4.3 Results

	$d_c$	$d_{max} (average)$	$d(t)$	$P_{st}$	$P_{lt}$
<b>Limits</b>	3.3%	7%	3.3%/500ms	N/A	N/A
<b>Result</b>	0.0%	1.69%	1.79%/0ms	–	–

## 5 Immunity Test

### 5.1 Performance Criteria Description in Clause 6 of EN IEC 55014-2

<b>Criterion A:</b>	The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.
<b>Criterion B:</b>	The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation and from what the user may reasonably expect from the apparatus if used as intended.
<b>Criterion C:</b>	Temporary loss of function is allowed, provided the function is self recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

### 5.2 Classification of apparatus

<b>Category I:</b>	equipment containing no electronic control circuitry.
<b>Category II:</b>	mains operated equipment containing electronic control circuitry with no clock frequency higher than 15 MHz.
<b>Category III:</b>	battery operated equipment not included in Category I. This category also includes equipment provided with rechargeable batteries, which can be charged, directly or indirectly, from the mains. Accordingly, this equipment shall also be subjected to the test requirements for mains operated equipment but only when testing the charging function If the equipment can operate its intended functions when connected, directly or indirectly to the mains, then it is not battery operated. Accordingly, it shall be classified as Category II, Category IV or Category V, as applicable, and subjected to the corresponding test requirements when in mains operation.
<b>Category IV:</b>	mains operated equipment containing electronic control circuitry with a highest clock frequency greater than 15 MHz but lower than or equal to 200 MHz.
<b>Category V:</b>	mains operated equipment containing electronic control circuitry with a highest clock frequency greater than 200 MHz.

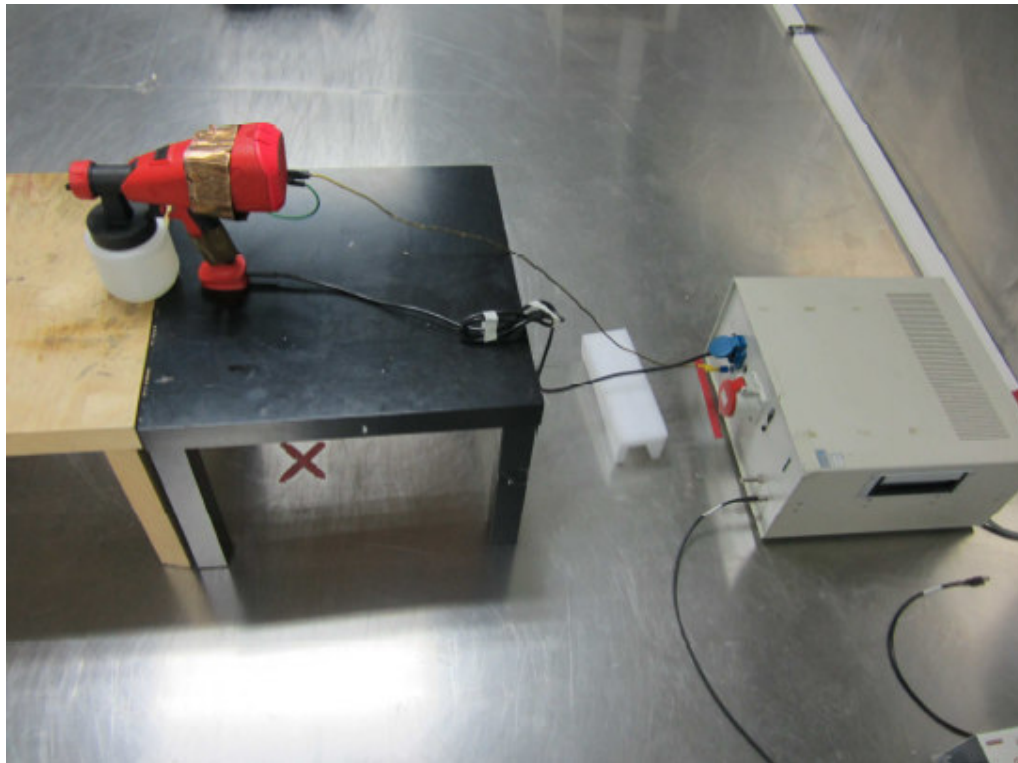
The EUT belongs to Category I.

## 6 Test Setup Photos

Harmonic & Flicker



Conducted Emission



Test Report No.: EFSH24120254-IE-02-E01

Eurofins Electrical Testing Service (Shanghai) Co., Ltd.  
Building 18, No.2168 Chenhang Highway, Minhang District, Shanghai, China

Disturbance power



---

Test Report No.: EFSH24120254-IE-02-E01

Eurofins Electrical Testing Service (Shanghai) Co., Ltd.  
Building 18, No.2168 Chenhang Highway, Minhang District, Shanghai, China

## 7 EUT Photos

Photo 1.  
Description: Overview



Photo 2.  
Description: Overview



---

Test Report No.: EFSH24120254-IE-02-E01

Eurofins Electrical Testing Service (Shanghai) Co., Ltd.  
Building 18, No.2168 Chenhang Highway, Minhang District, Shanghai, China



Photo 3.  
Description: Overview



Photo 4.  
Description: Overview



---

Test Report No.: EFSH24120254-IE-02-E01

Eurofins Electrical Testing Service (Shanghai) Co., Ltd.  
Building 18, No.2168 Chenhang Highway, Minhang District, Shanghai, China