

EMC Test Report for FCC

On Behalf of
Suzhou Daming Electric Co., Ltd.

Summary

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

47CFR Part 18 (2006): Industrial, Scientific, and Medical Equipment

FCC/OET MP-5 (1986): FCC Methods of Measurements of Radio Noise Emissions From Industrial, Scientific, and Medical Equipment

ANSI C63.4 (2003): Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz.

Description

The appliances were tested by Intertek Testing Services ETL SEMKO Shanghai Limited and found compliance with relevant requirements described in FCC Part 18 RF lighting Device.

Test results are contained in this test report and Intertek Testing Services ETL SEMKO Shanghai Limited is assumed full responsibility for the accuracy and completeness of these measurements.

The test report applies to tested samples only and shall not be reproduced in part without written approval of Intertek Testing Services ETL SEMKO Shanghai Limited.

Date of Test: May 15, 2007

Date of Issue: September 15, 2007

Prepared by:



Eliot Huang (*Project Engineer*)

Report Approved by:



Jonny Jing (*Reviewer*)

FCC ID: VL7DM001DRH

Description of Test Facility

Name	Intertek Testing Service Shanghai Limited
Address	Building No.86, 1198 Qinzhou Road(North), Shanghai 200233, P.R. China
Telephone	86 21 64956565
Telefax	86 21 64956263

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1.Applicant Information

Applicant : SuZhou Daming Electric Co., Ltd
Weixi Village, Weitang Town, XiangCheng District, SuZhou, China

Manufacturer: SuZhou Daming Electric Co., Ltd
Weixi Village, Weitang Town, XiangCheng District, SuZhou, China

Description of EUT: The EUT is an Energy Saving Lamp. It has 3 models. All models use same PCB, the difference between models are lighting power and parameter of elements

FCC ID: VL7DM001DRH

Country of origin: P.R. China

Name of contact: Shen Yingping

Telephone: 0086-512-65904886

Telefax: 0086-512-65904887

2.Information of Equipment Under Test (EUT)

2.1 Identification of the EUT

Equipment: Energy Saving Lamp

Type of EUT: ☒ Production ☐ Pre-product ☐ Pro-type

Class of EUT: ☒ Consumer equipment ☐ Non-consumer equipment

Type/model: DRH-9;DRH-11;DRH-13

Serial number: none

Date of sample receipt: 2007-05-15

Date of test: 2007-05-15 ~ 7-10

Rating: 120V AC, 60Hz

2.2 Additional information about the EUT

none

2.3 Peripheral equipment

none

3. Conducted Powerline Measurement

3.1 Conduction Limit for Consumer RF lighting devices

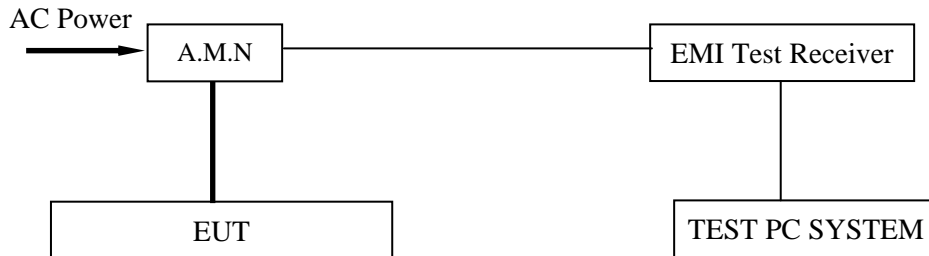
Frequency (MHz)	Maximum RF line voltage measured with a 50uH/50 ohm LISN	
	(μV)	dB(μV)
0.45-2.51 MHz	250	47.9
2.51-3.0 MHz	3000	69.5
3.0-30 MHz	250	47.9
RF Line Voltage dB(μV) = 20 lg RF Line Voltage (μV)		

3.2 Instruments List

The following instruments were used during the measurement of RF voltage conducted back into the power lines.

Item	Equipment	Manu.	Type	Serials no.	Last Cal.	Cal. Interval
1	EMI Test Receiver	Rohde & Schwarz	ESCS 30	828985/026	2007-1-23	1 Year
2	A.M.N.	Rohde & Schwarz	ESH2-Z5	825640/018	2007-1-23	1 Year

3.3 Test Setup



Note:
 ————— means “power line”
 ————— means “signal line”

3.4 Test Configuration

The Conducted Powerline Measurement was proceeded in a shielded room.

The EUT was connected to AC power source through an Artificial Mains Network (A.M.N.). which provides a 50 ohm, standardized RF impedance for the measured equipment. Other support equipment was powered by another AMN.

The EUT was placed on a 1m×1.5m×0.8m wooden table and keep 40 centimeters from the wall of the earthed shielded room, which was considered as Ground Reference Plane(GRP), and kept at least 80 centimeters from any other earthed conducting surface. The EUT was placed at a distance of 80 centimeters from the AMN’s, and connected thereto by a unshielded lead of 1 meter in length.

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition.

The frequency range from 450 kHz to 30 MHz was checked.

The bandwidth of Test Receiver ESCS 30 was set at 9 kHz.

After scanned by automatic peak mode, the frequency producing the max. level was reexamined using the detector function set to the CISPR Quasi-peak mode by manual.

The EUT, support equipment and interconnecting cables were arranged and manipulated to maximize each emission. Each emission was maximized by switching power lines, varying the mode of operation or resolution, clock or data exchange speed, if applicable,

whichever determined the worst-case emission.

During measurement, EUT was set at “Lighting ” mode.

Test Results were listed in sec. 3.6.

3.5 Test Procedure

3.5.1 Establish the test setup as sec. 3.3.

3.5.2 Set the EUT to “Lighting” mode.

3.5.3 Proceed the measurement

3.6 Test Results

☒ Pass ☐ Fail

3.6.1 Measurement environment

Temperature : 25 °C Relative Humidity : 47 %

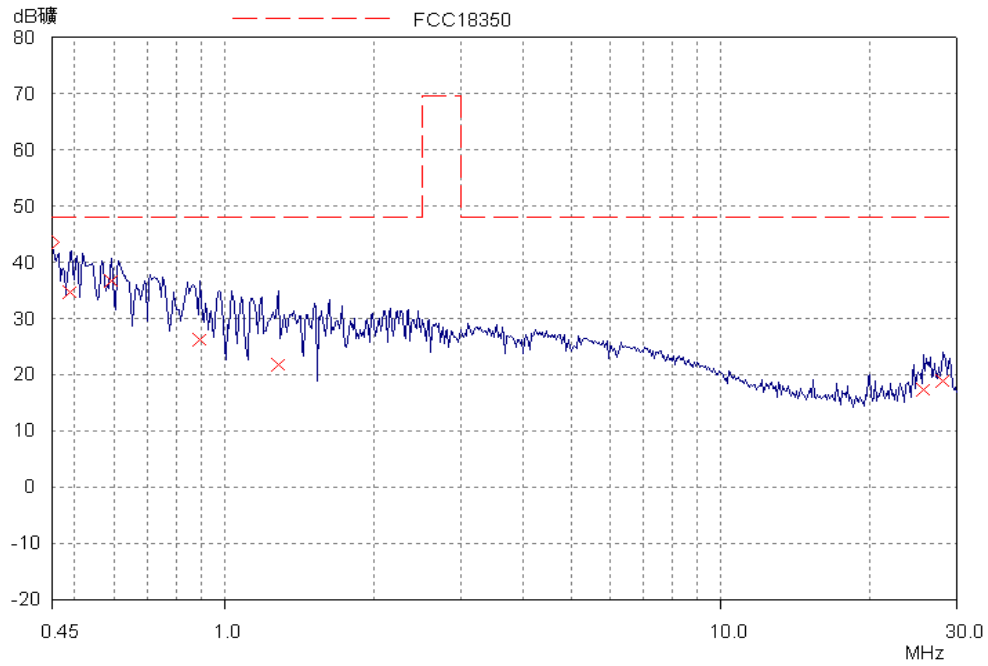
3.6.2 Data table

All emissions not listed below are too low against the prescribed limits.

Model: **DRH-9**

Frequency (MHz)	Line (L/N)	Factor (dB)	Quasi-peak		Margin dB(uV)
			Disturbance level dB(uV)	Permitted limit dB(uV)	
0.48	L	0.38	34.63	18.00	13.37
0.52	N	0.38	37.84	48.00	10.16
<i>0.61</i>	<i>N</i>	<i>0.39</i>	<i>40.60</i>	<i>48.00</i>	<i>7.40</i>
0.89	N	0.82	34.44	48.00	13.56
1.53	L	0.80	32.75	48.00	15.25
25.57	L	1.20	*	48.00	*
28.03	L	1.30	*	48.00	*
<p>Note: 1. Since the test software will automatically add the LISN transducer and cable loss to the reading level, only the emission level was listed in the test report.</p> <p>2. “*” means margin > 20dB</p> <p>3. the worst emission was marked out in italic</p>					

Waveform



Model: **DRH-11**

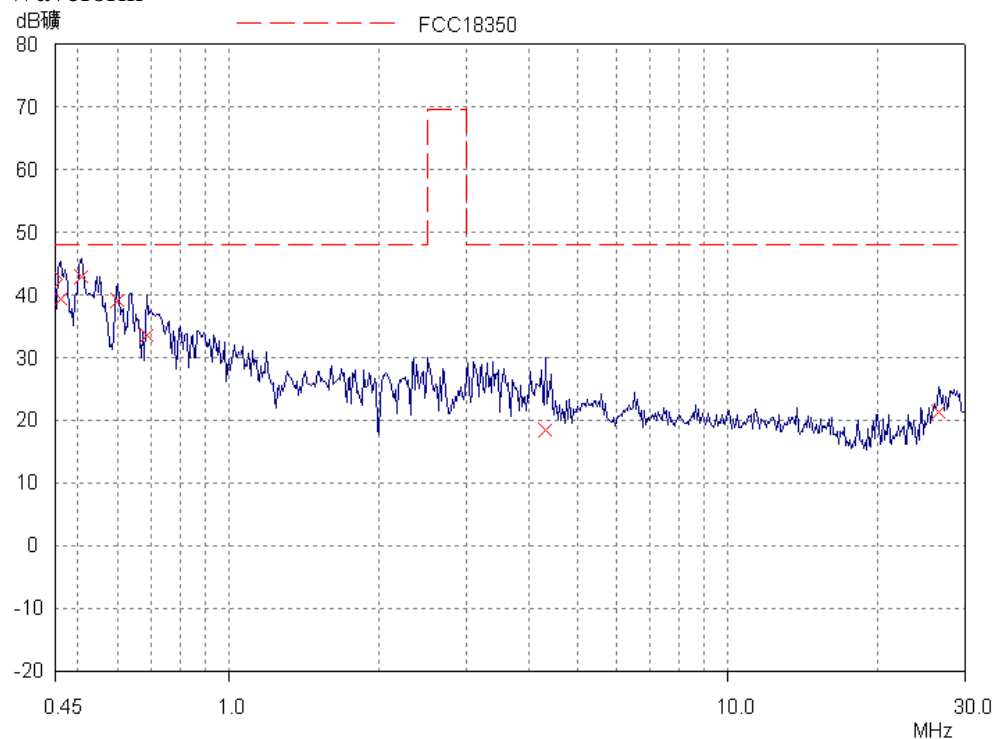
Frequency (MHz)	Line (L/N)	Factor (dB)	Quasi-peak		Margin dB(uV)
			Disturbance level dB(uV)	Permitted limit dB(uV)	
0.46	N	0.38	39.34	48.00	8.66
<i>0.51</i>	<i>N</i>	<i>0.38</i>	<i>43.01</i>	<i>48.00</i>	<i>4.99</i>
0.60	N	0.39	39.16	48.00	8.84
4.30	N	0.91	*	48.00	*
25.98	L	1.20	*	48.00	*
26.40	N	1.20	*	48.00	*
28.48	L	1.30	*	48.00	*

Note: 1. Since the test software will automatically add the LISN transducer and cable loss to the reading level, only the emission level was listed in the test report.

2. “*” means margin > 20dB

3. the worst emission was marked out in italic

Waveform



Model: **DRH-13**

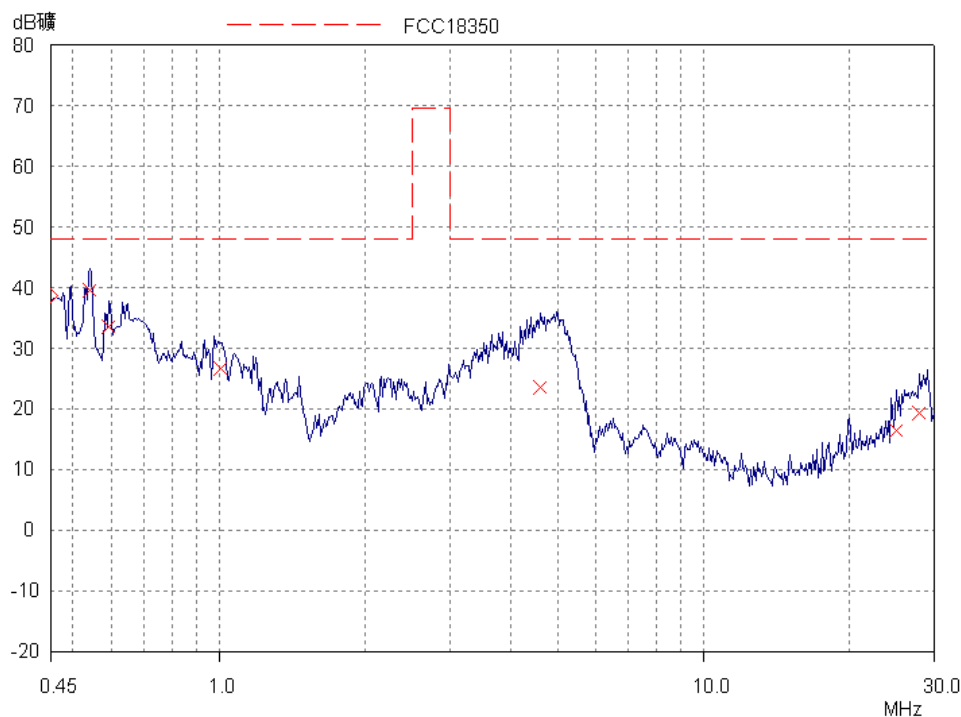
Frequency (MHz)	Line (L/N)	Factor (dB)	Quasi-peak		Margin dB(uV)
			Disturbance level dB(uV)	Permitted limit dB(uV)	
0.48	N	0.38	31.17	48.00	16.83
<i>0.54</i>	<i>L</i>	<i>0.38</i>	<i>39.58</i>	<i>48.00</i>	<i>8.42</i>
0.60	L	0.39	33.65	48.00	14.35
4.58	N	0.91	32.28	48.00	15.72
24.96	L	1.10	*	48.00	*
26.40	N	1.20	*	48.00	*
27.92	L	1.30	*	48.00	*

Note: 1. Since the test software will automatically add the LISN transducer and cable loss to the reading level, only the emission level was listed in the test report.

2. “*” means margin > 20dB

3. the worst emission was marked out in italic

Waveform



3.7 Measurement Uncertainty

Measurement uncertainty of conducted power line test is $\pm 3.34\text{dB}$

The measurement uncertainty is given with a confidence of 95%, $k=2$.

4. Radiated emission Measurement

4.1 Radiated emission Limit for RF lighting consumer devices

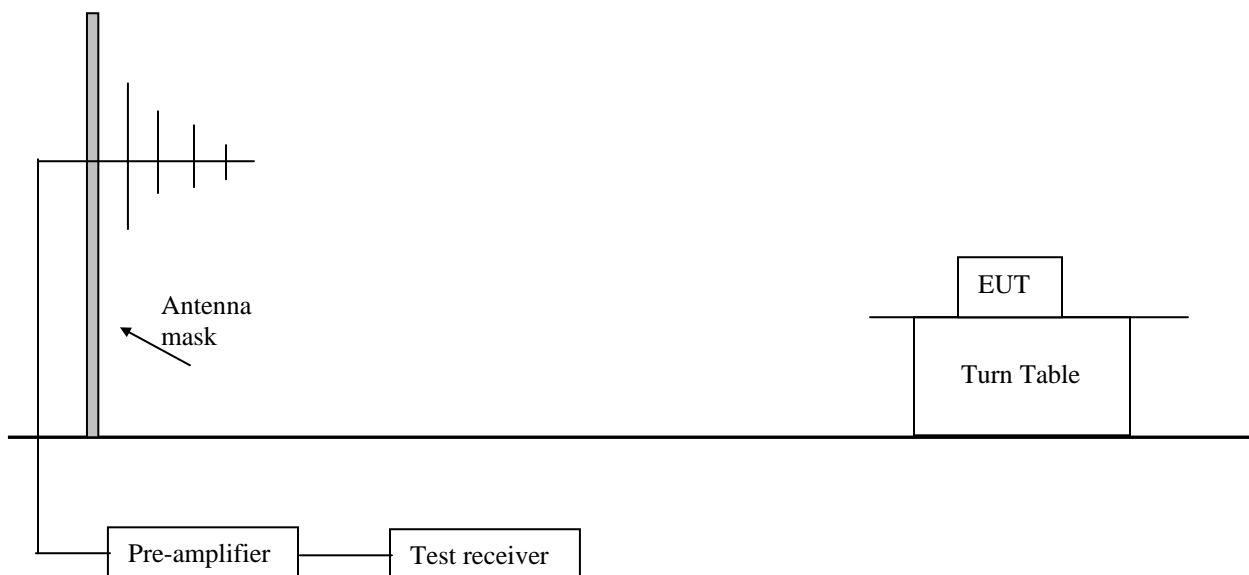
Frequency of emission (MHz)	Field Strength at 3m (microvolts/meter)	Field strength at 3m (dB μ V/m)
30-88	100	40.0
88-216	150	43.5
216-1000	200	46.0
Radiated emission in dB μ V/m = 20lg (microvolts/meter)		

4.2 Instruments List

The following instruments were used during the measurement of Radiated emission test

Item	Equipment	Manu.	Type	Internal no.	Last Cal.	Cal. Interval
1	EMI Test Receiver	Rohde & Schwarz	ESI 26	EC 3045	2007-6-30	1 Year
2	ULTRA BROADBAND ANTENNA ULTRALOG	Rohde & Schwarz	HL 562	EC 3046-1	2007-6-30	1 Year
3	Semi - anechoic chamber	-	Albatross project	EC 3048	2007-7-13	1 Year

4.3 Test Setup



4.4 Test Configuration

The Radiated emission Measurement was conducted in a semi-anechoic chamber, the distance between the EUT boundary and the antenna was 3 meters.

The EUT was placed on a 1.5 by 0.8m wooden table and was fed by standard audio and video signal for operation.

The turntable rotating from 0 to 360 degree, and the receiving antenna varying from 100cm to 400cm during the test for the maximum emission, and the cables of the EUT was varied to get the maximum emission level.

Both Horizontal and Vertical polarization was scanned.

The frequency range from 30MHz to 1000 MHz was checked.

The bandwidth of Test Receiver ESI 26 was set at 120 kHz.

Test Results were listed in sec. 4.6.

4.5 Test Procedure

4.5.1 Establish the test setup as sec. 4.3.

4.5.2 Start operating the EUT

4.5.3 Proceed the measurement.

4.6 Test Results

☒ Pass ☐ Fail ☐ NA

4.6.1 Measurement environment

Temperature : 22 °C

Relative Humidity : 53 %

4.6.2 Test Personnel

Name: Eliot Huang Title: Engineer

Tel: 86-21-64956565*276

Fax: 86-21-54262335

4.6.3 Data table

All emissions not listed below are too low against the prescribed limits.

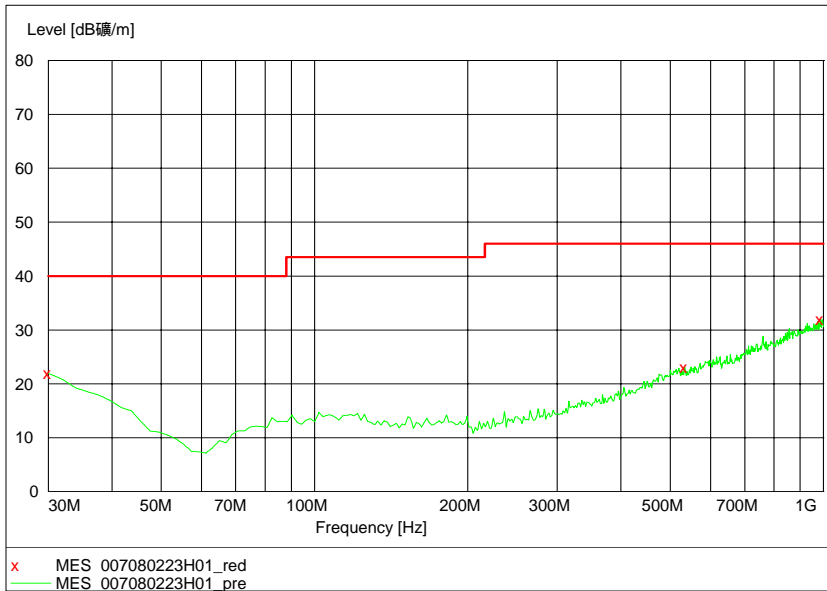
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level dB(μV)	Limits dB(μV)	Margin (dB)	Antenna Height (cm)	Azimuth (degree)	Polarization
30.00	0.5	19.5	22.50	40.0	17.50	100.0	0.00	V
34.45	0.5	19.5	22.10	40.0	17.90	100.0	0.00	V
80.00	1.1	10.3	*	40.0	*	100.0	0.00	V
100.00	1.1	8.3	*	43.5	*	100.0	0.00	H
617.25	3.0	18.5	*	46.0	*	100.0	180.00	H
<i>1000.00</i>	<i>3.9</i>	<i>22.0</i>	<i>30.10</i>	<i>46.0</i>	<i>15.90</i>	<i>100.0</i>	<i>180.00</i>	<i>V</i>

Note: 1. Since the test software will automatically add the Antenna Factor and cable loss to the reading level, only the emission level was listed in the test report.

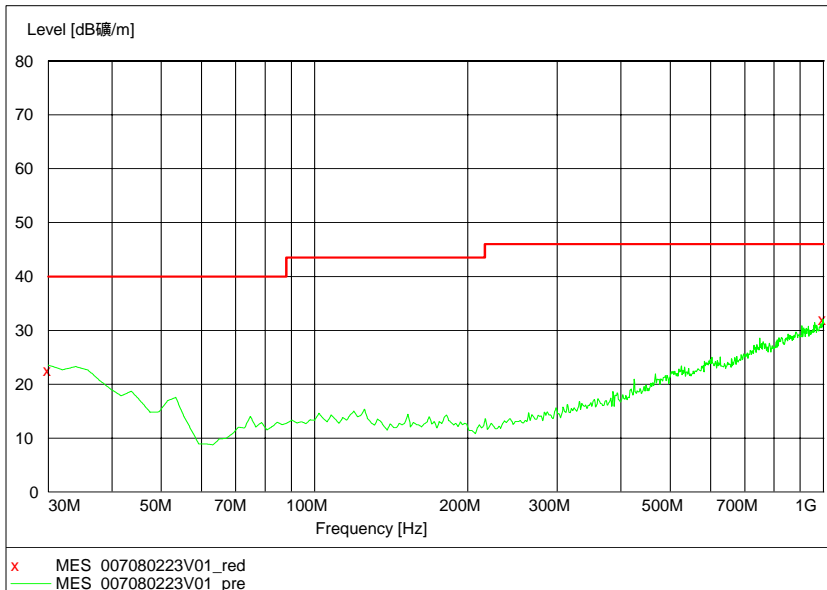
2. “*” means margin > 20dB

3. the worst emission was marked out in italic

Waveform Horizontal



Vertical



4.7 Measurement uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.

Measurement uncertainty is calculated in accordance with CISPR 16-4-2: 2003

Measurement uncertainty : $\pm 5.2\text{dB}$

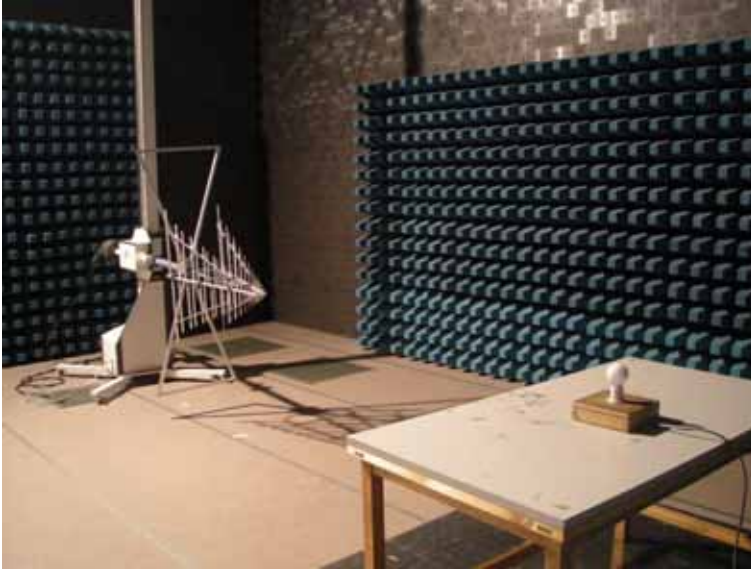
The measurement uncertainty is given with a confidence of 95%, $k=2$.

5. Photograph of Test setup

Conducted Powerline Measurement



Radiated emission Measurement



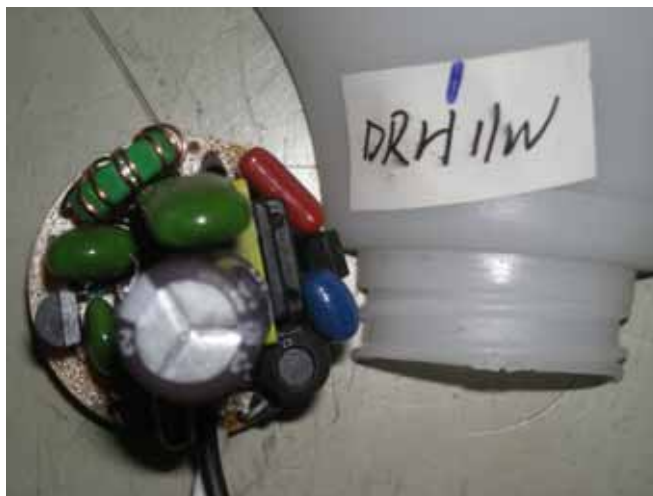
6. Photograph of EUT

DRH-9





DRH-11





DRH-13



