

EMC Test Report for FCC

On Behalf of
Aurum Electronic Corp.

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: July 27 ~ October 25, 2007


Date of Issue: December 05, 2007

Prepared by:



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Report Approved by:



Jonny Jing (*Reviewer*)

Description of Test Facility

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1.Applicant Information

Applicant : Aurum Electronice Corp.
4th Industrial area, Her-Shoei-Kou Village Gong-Ming Town, Bao-An
District, Shenzhen city, Guang dong Province, China

Manufacturer: Shanghai Jinsheng Industry & Trading Co., Ltd.
No. 4928, Waiqingsong Road, Qingpu District, Shanghai

Description of EUT: The EUT is a Flood light. It has 3 models. Model AEC-3500P and AEC-3500LT are same except the appearance and the tube fitting. AEC-3500LT2 is same with AEC-3500LT but has two lamps. All models use same PCB. Therefore, model AEC-3500P and AEC-3500LT2 are chosen to test as representative and the worst test data is listed in the report.

FCC ID: VMA-AEC-3500H

Country of origin: P.R. China

Name of contact: Ms. May Wang

Telephone: 0086-755-27107809

Telefax: 0086-755-27738491

2.Information of Equipment Under Test (EUT)

2.1 Identification of the EUT

Equipment: Flood light

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

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

Type/model: AEC-3500P, AEC-3500LT, AEC-3500LT2

Serial number: none

Date of sample receipt: 2007-07-26

Date of test: 2007-07-27 ~ 10-25

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

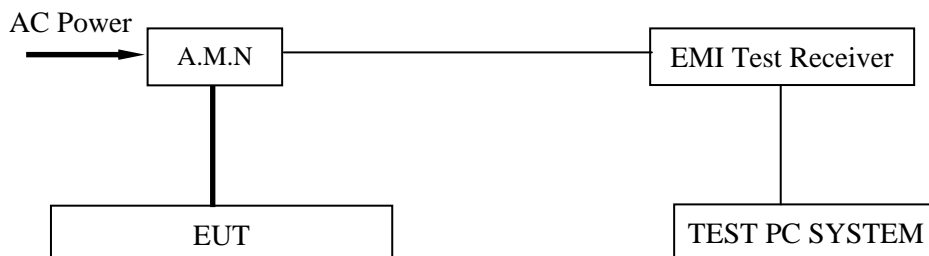
Frequency (MHz)	Maximum RF line voltage measured with a 50uH/50 ohm LISN	
	(μV)	dB(μV)
0.45-2.51 MHz	250	47.9
2.51-3.0 MHz	3000	69.5
3.0-30 MHz	250	47.9
RF Line Voltage dB(μV) = 20 lg RF Line Voltage (μV)		

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 : 22 °C Relative Humidity : 53 %

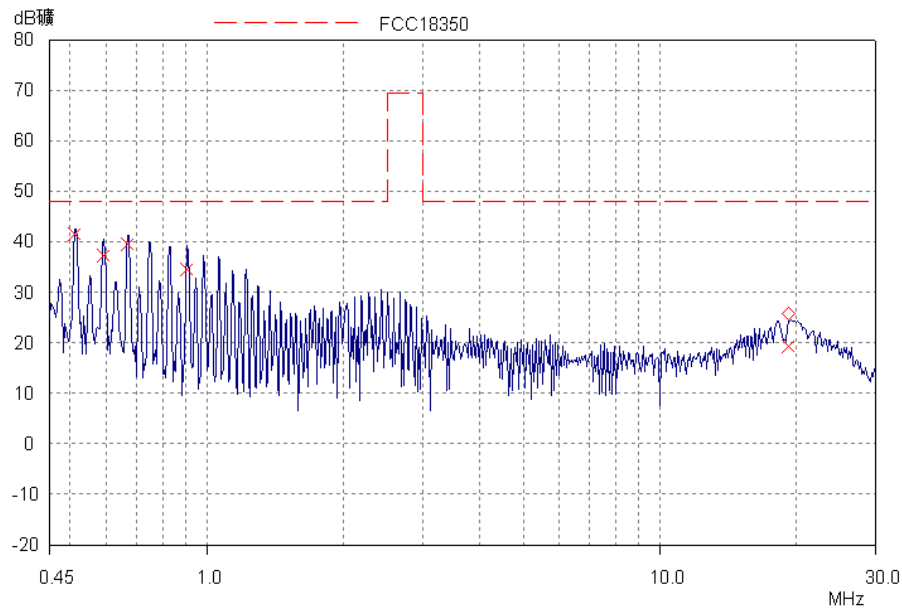
3.6.2 Data table

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

Model: **AEC-3500P**

Frequency (MHz)	Line (L/N)	Factor (dB)	Quasi-peak		Margin dB(uV)
			Disturbance level dB(uV)	Permitted limit dB(uV)	
<i>0.51</i>	<i>N</i>	<i>0.38</i>	<i>41.53</i>	<i>48.00</i>	<i>6.47</i>
0.59	L	0.38	37.34	48.00	10.66
0.67	N	0.39	39.36	48.00	8.64
0.90	L	0.82	34.55	48.00	13.45
19.26	N	1.10	*	48.00	*
30.00	L	1.50	*	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: AEC-3500LT2

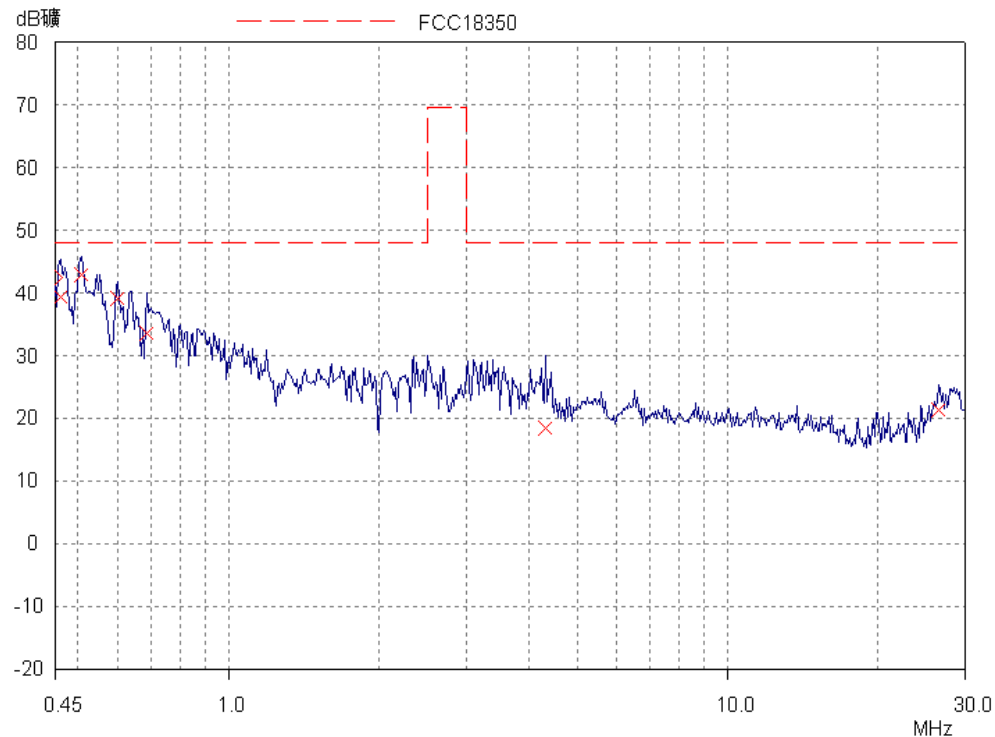
Frequency (MHz)	Line (L/N)	Factor (dB)	Quasi-peak		Margin dB(uV)
			Disturbance level dB(uV)	Permitted limit dB(uV)	
0.46	N	0.38	39.34	48.00	8.66
<i>0.51</i>	<i>N</i>	<i>0.38</i>	<i>43.01</i>	<i>48.00</i>	<i>4.99</i>
0.60	N	0.39	39.16	48.00	8.84
4.30	N	0.91	*	48.00	*
25.98	L	1.20	*	48.00	*
26.40	N	1.20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



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

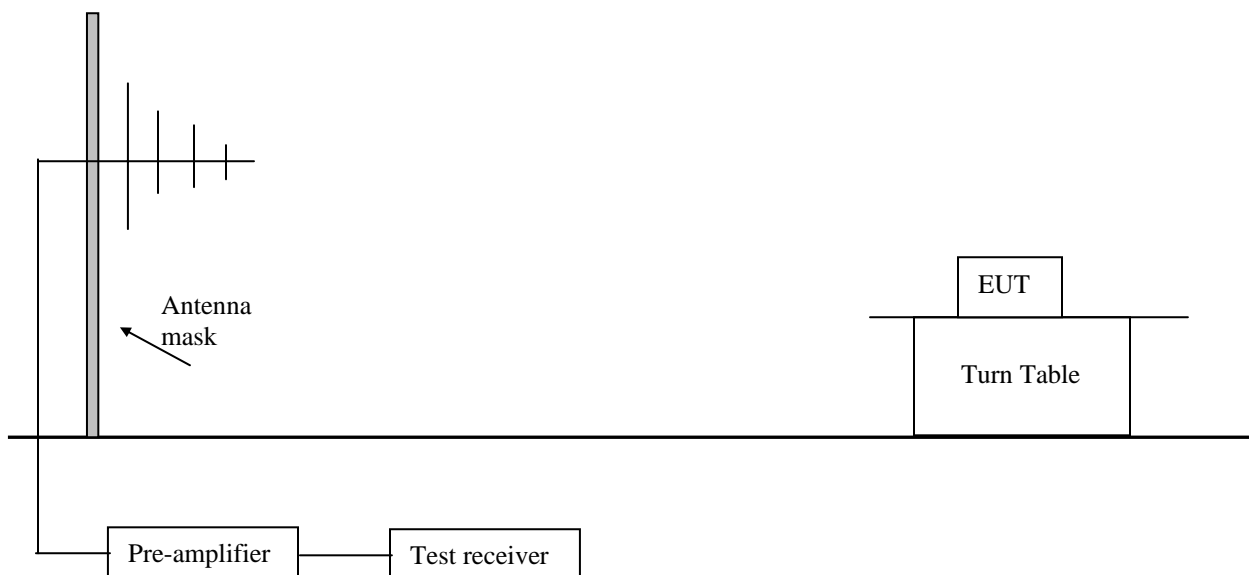
Frequency of emission (MHz)	Field Strength at 3m (microvolts/meter)	Field strength at 3m (dBμV/m)
30-88	100	40.0
88-216	150	43.5
216-1000	200	46.0
Radiated emission in dBμV/m = 20lg (microvolts/meter)		

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 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
30.18	0.5	15.2	22.50	40.0	16.80	100.0	0.00	H
<i>34.77</i>	<i>0.5</i>	<i>15.2</i>	<i>26.20</i>	<i>40.0</i>	<i>13.80</i>	<i>100.0</i>	<i>0.00</i>	<i>H</i>
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	0.00	H
986.39	3.9	22.0	31.42	46.0	14.58	100.0	0.00	H

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.

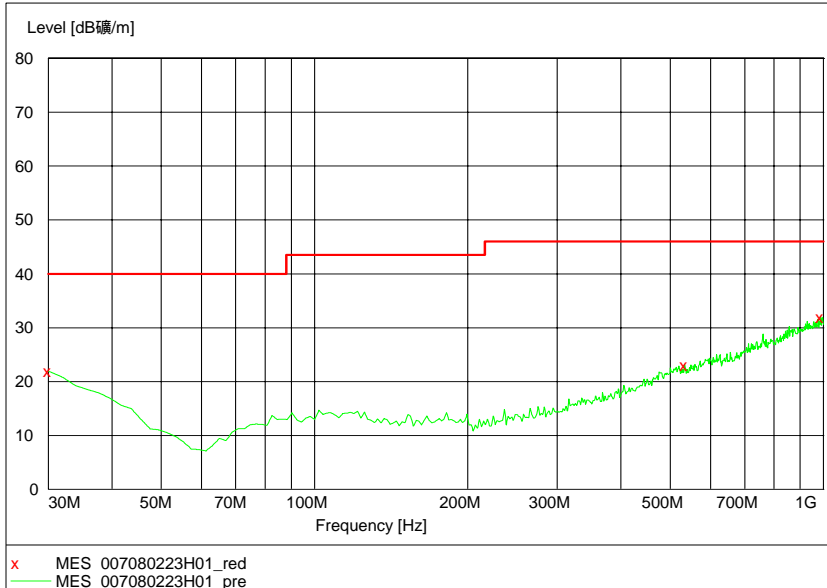
2. “*” means margin > 20dB

3. the worst emission was marked out in italic

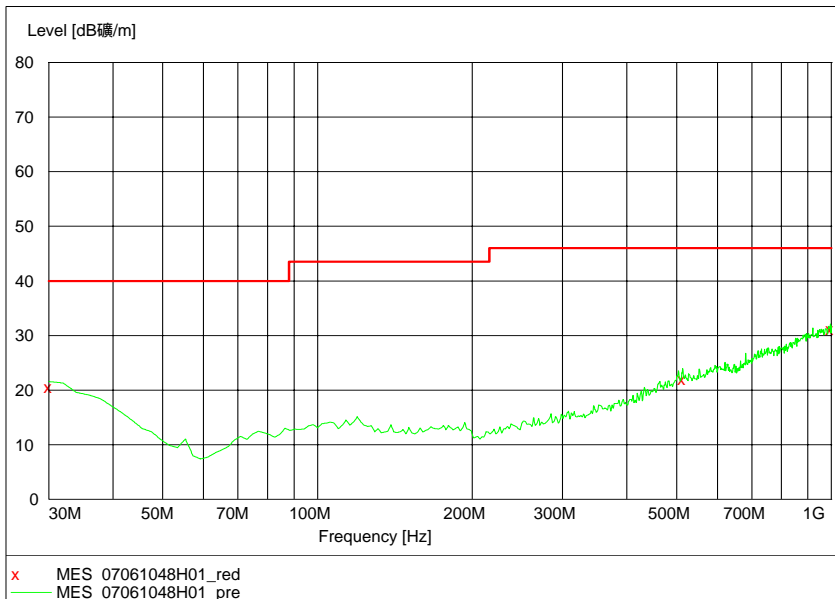
Waveform

For model **AEC-3500P**

Horizontal

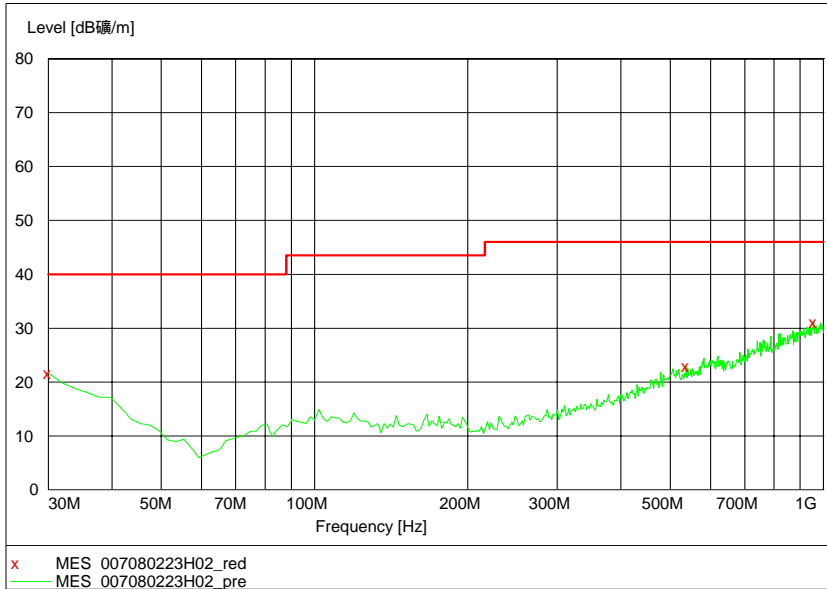


Vertical

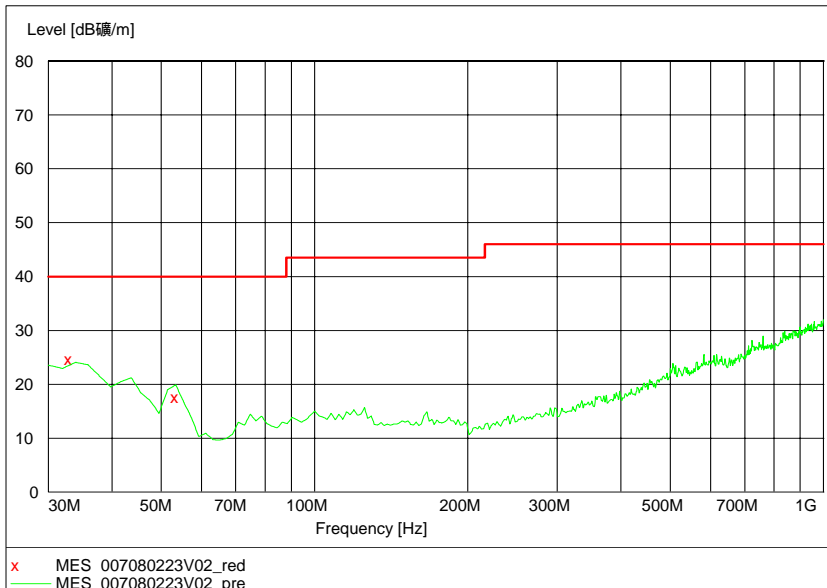


For model **AEC-3500LT2**

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 : $\pm 5.20\text{dB}$

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

5. Photograph of Test setup

Conducted Powerline Measurement

For model: **AEC-3500P**

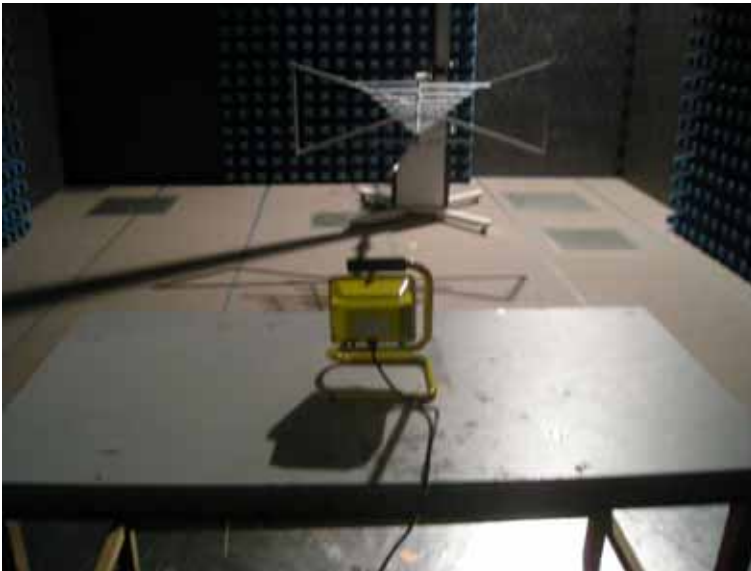
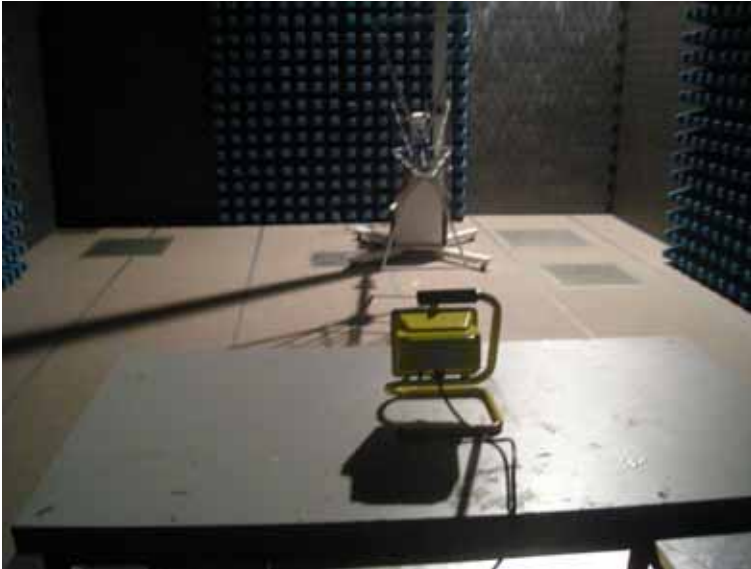


For model: **AEC-3500LT2**



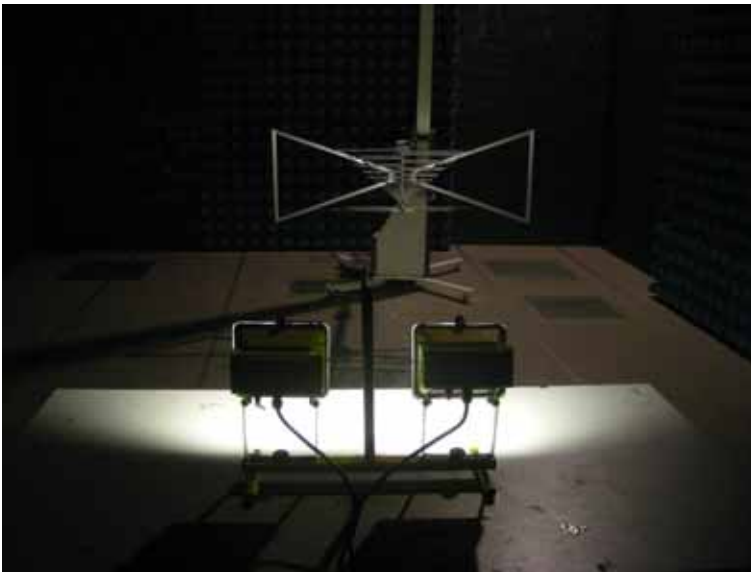
Radiated emission Measurement

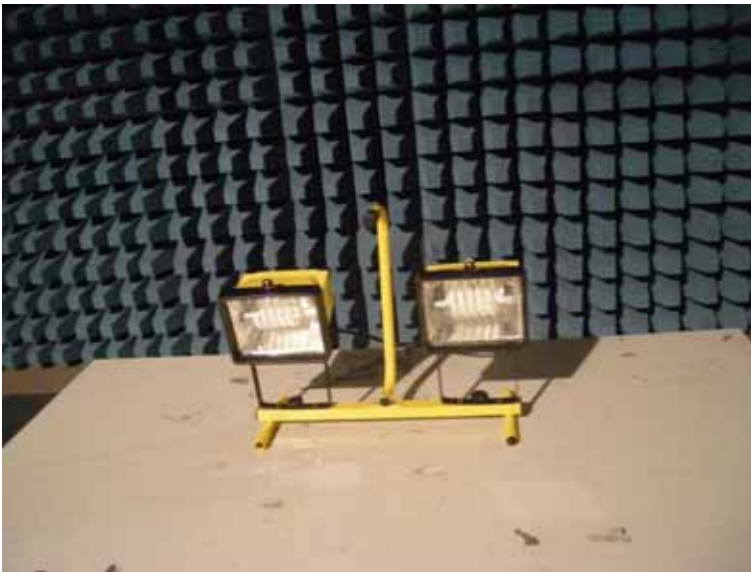
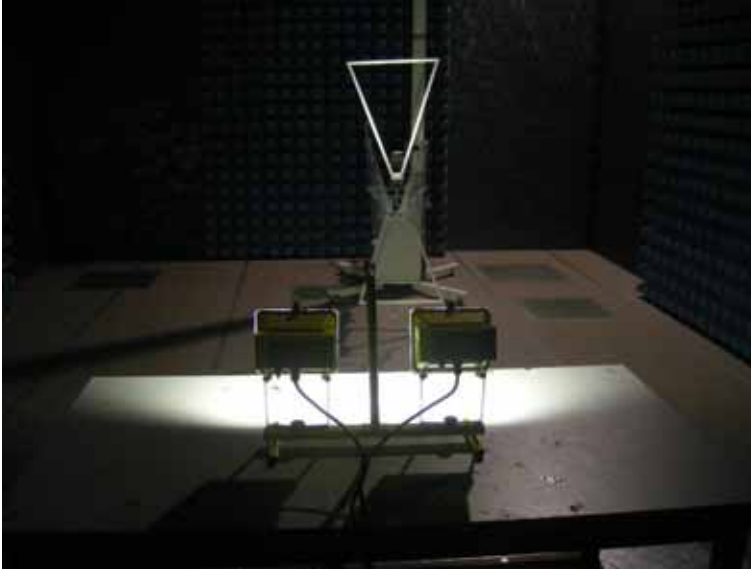
For model: **AEC-3500P**





For model: **AEC-3500LT2**





6. Photograph of EUT

AEC-3500P



AEC-3500LT



AEC-3500LT2





Appendix I: Components list

NO.	code name	Spec	PC	Manufacturer
1	C1	MPX-X2-250Vac-224 -40 -110	1	Dain Electronics Co.,LTD
2	C4	CT81-1000V-1n0-J p=7.5	1	Changxing Qixing Capacitor Limited company
3	C5	CBB22-400V-100n-J p=10mm	1	Changxing Qixing Capacitor Limited company
4	C6	CL11-100V-22n-J p=5mm	1	Changxing Qixing Capacitor Limited company
5	C7	CL21-100V-100n-J p=5mm	1	Changxing Qixing Capacitor Limited company
6	C9B	CBB28-1250V-8n2-J p=10mm	1	Changxing Qixing Capacitor Limited company
7	C9	CBB28-1250V-8n2-J p=10mm	1	Changxing Qixing Capacitor Limited company
8	C8	CD288H-35V-100 μ F 85	1	YIYANG ZIJIANG ELECTRONIC ELECTRONICS CO.,LTD
9	C10,C11	TYPE JD Rating 250v,AC 1n0		JYH CHUNG ELECTRONICS CO.,LTD
10	C3、 C2	CD11GH-200V-22 μ F 105	2	YIYANG ZIJIANG ELECTRONIC ELECTRONICS CO.,LTD
11	C12	CBB22-400V-100n-J p=10mm		Changxing Qixing Capacitor Limited company
12	R1、 R2	RT-150K-1/4W-J	2	NANJIN RADIO NO.11 FACTORY
13	R3	RT-330K-1/4W-J	1	NANJIN RADIO NO.11 FACTORY
14	R5、 R4	RT-12 -1/4W-J	2	NANJIN RADIO NO.11 FACTORY
15	R7、 R6	RT-1.0 -1/4W-J	2	NANJIN RADIO NO.11 FACTORY
16	R8	RT-10K -1/4W-J	1	NANJIN RADIO NO.11 FACTORY
17	R9	RT-47K -1/4W-J	1	NANJIN RADIO NO.11 FACTORY
18	R10	RT-3.6K-1/4W-J	1	NANJIN RADIO NO.11 FACTORY
19	R11	RT-100 -1/2W-J	1	NANJIN RADIO NO.11 FACTORY
20	R12	RT-510K-1/4W-J	1	NANJIN RADIO NO.11 FACTORY
21	Fuse	Cat.NO.3k.rated2A,125/250Vac	1	Shenzhen Lanson Electronics CO.,LTD
22	D1-4、 D7,D8	IN4007	6	CHANGZHOU STAR SEA ELECTRONICS CO.,LTD
23	D5、 D6、 D9	FR107	3	CHANGZHOU STAR SEA ELECTRONICS CO.,LTD
24	DB3-1、 DB3-2	DB3	2	CHANGZHOU STAR SEA ELECTRONICS CO.,LTD
25	T	9x5x4 7/3/3	1	ZHOU ZHUANG ELECTRONIC FACTORY
26	TR1、 TR2	D13005K	2	JILIN SINO-MICROELECTRONICS CO.,LTD
27	TR3	BT169D OR MCR100-6	1	PHILIPS
28	L2	UF10.5 L > 30mH	1	ZHOU ZHUANG ELECTRONIC FACTORY
29	L3	EE22 SP100	1	ZHOU ZHUANG ELECTRONIC FACTORY
30	L	1015# Rated 18AWG,105	1	SHANGHAI PLASTIC WIRE FACTORY

		600V		
31	N	1015# Rated 18AWG,105 600V	1	SHANGHAI PLASTIC WIRE FACTORY
32	G	1015# Rated 20AWG,106 600V	1	SHANGHAI PLASTIC WIRE FACTORY
33	P1、 P2	1015# Rated 18AWG,105 600V	2	SHANGHAI PLASTIC WIRE FACTORY
34	P3、 P4	1015# Rated 18AWG,105 600V	2	SHANGHAI PLASTIC WIRE FACTORY
35	PCB	JS12036WB PFR-1 94V-0 130	1	PAN AN PCB FACTORY
36	CASE	HAC-8250FR V-0 ABS/PBT	1	KOREA KUMHO PETROCHEMICAL CO.,LTD
37	MAGNET WIRE TYPE:UEW rated:MW79,155			SHANGHAI ASLA PACIFIC ELECTRIC CO.,LTD
38	INSULATING TAPE TYPE:JY312(#) 130			SUZHOU JINGYI SPECIAL ADHESIVE TAPE CO.,LTD
39	BOBBIN PMC- T375J,rated 94v-0,150 ,1.5mm thick			CHANG CHUN PLASTICS CO.,LTD