FCC TEST REPORT

For

Benory Industrial Co., Limited

LED T8 Tube Light

Model No. : BNL-UL-9W-54, BNL-UL-9W-72, BNL-UL-9W-90, BNL-UL-18W-100, BNL-UL-18W-120, BNL-UL-18W-14,0 BNL-UL-18W-160, BNL-UL-18W-180, BNL-UL-22W-110, BNL-UL-22W-132, BNL-UL-22W-154, BNL-UL-22W-176, BNL-UL-22W-198, BNL-UQ-9W-54, BNL-UQ-9W-72, BNL-UQ-9W-90, BNL-UQ-18W-100, BNL-UQ-18W-120, BNL-UQ-18W-14,0 BNL-UQ-18W-160, BNL-UQ-18W-180, BNL-UQ-22W-110, BNL-UQ-22W-132, BNL-UQ-22W-154, BNL-UQ-22W-176, BNL-UQ-22W-198

Prepared for : Benory Industrial Co., Limited
Address : 2/F Bldg 167 Xiayousong Industrial Area Longhua Shenzhen,Guangdong 518109 CHINA

Prepared By : Shenzhen SAIL Testing Technology Co.,Ltd
Address : 18th, 4F New Village Gushu Park, Bao'anDistrict, Shenzhen 518000, P.R.China

Report Number	:	HZE1400620108
Date of Receipt	:	December 20, 2013
Date of Test	:	December 21-24, 2013
Date of Report	:	March 25, 2014

TABLE OF CONTENTS

TEST REPORT VERIFICATION

Applicant	: Benory Industrial Co., Limited
Manufacturer	: Shenzhen HuaTianweiye Technology Co., Ltd
EUT Description	: LED T8 Tube Light
(A) Model No.	: BNL-UL-9W-54, BNL-UL-9W-72, BNL-UL-9W-90, BNL-UL-18W-100, BNL-UL-18W-120, BNL-UL-18W-14,0 BNL-UL-18W-160, BNL-UL-18W-180, BNL-UL-22W-110, BNL-UL-22W-132, BNL-UL-22W-154, BNL-UL-22W-176, BNL-UL-22W-198, BNL-UQ-9W-54, BNL-UQ-9W-72, BNL-UQ-9W-90, BNL-UQ-18W-100, BNL-UQ-18W-120, BNL-UQ-18W-14,0 BNL-UQ-18W-160, BNL-UQ-18W-180, BNL-UQ-22W-110, BNL-UQ-22W-132, BNL-UQ-22W-154, BNL-UQ-22W-176, BNL-UQ-22W-198
(B) Trademark	: N/A
(C) Ratings Supply	: AC 100-277V, 50/60Hz
(D) Test Voltage	: AC 120V/60Hz

Measurement Standard Used:

FCC Rules and Regulations Part 15 Subpart B Class B 2013, ANSI C63.4-2003

The device described above is tested by Shenzhen SAIL Testing Technology Co.,Ltd to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart B Class B limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen SAIL Testing Technology Co.,Ltd is assumed of full responsibility for the accuracy and completeness of these tests.
After the test, our opinion is that EUT compliance with the requirement of the above standards.
This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen SAIL Testing Technology Co.,Ltd

Tested by (name + signature).....:	Tom Zhu Test Engineer	Tom Zhu .....
Approved by (name + signature).....:	Frank Hu Project Manager	Frank Hu .....
Date of issue..... .....:	March 25, 2014	

1. SUMMARY OF STANDARDS AND RESULTS

1.1.Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below.

EMISSION			
Description of Test Item	Standard	Limits	Results
Power Line Conducted Emission Test	FCC Part 15: 2013 ANSI C63.4: 2003	Class B	PASS
Radiated Emission Test	FCC Part 15: 2013 ANSI C63.4: 2003	Class B	PASS
N/A is an abbreviation for Not Applicable.			

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

Description : LED T8 Tube Light

Model Number : BNL-UL-9W-54, BNL-UL-9W-72, BNL-UL-9W-90, BNL-UL-18W-100, BNL-UL-18W-120, BNL-UL-18W-14,0 BNL-UL-18W-160, BNL-UL-18W-180, BNL-UL-22W-110, BNL-UL-22W-132, BNL-UL-22W-154, BNL-UL-22W-176, BNL-UL-22W-198, BNL-UQ-9W-54, BNL-UQ-9W-72, BNL-UQ-9W-90, BNL-UQ-18W-100, BNL-UQ-18W-120, BNL-UQ-18W-14,0 BNL-UQ-18W-160, BNL-UQ-18W-180, BNL-UQ-22W-110, BNL-UQ-22W-132, BNL-UQ-22W-154, BNL-UQ-22W-176, BNL-UQ-22W-198

Trademark : N/A

Applicant : Benory Industrial Co., Limited
Address : 2/F Bldg 167 Xiayousong Industrial Area Longhua Shenzhen,Guangdong 518109 CHINA

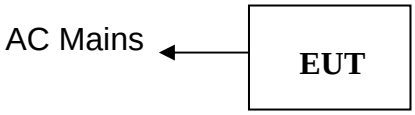
Manufacturer : Shenzhen HuaTianweiye Technology Co., Ltd
Address : Area A 3F, No. 14, Zhengxing Road, carp River Industrial Zone, Gongming Street Village, Guangming New District, Shenzhen

Sample Type : Prototype production
Remark: This report filing the report number HZE131214759, the only difference is the Applicant name, Applicant address and model number, so the test data reference original report number HZE131214759 test data.

2.2.Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number
1.	N/A	N/A	N/A	N/A

2.3. Block Diagram of connection between EUT and simulators



※ EUT: LED T8 Tube Light

2.4. Test Facility

2.4.1. Laboratory Name:

Shenzhen SAIL Testing Technology Co.,Ltd

2.4.2. Site Location :

18th, 4F New Village Gushu Park, Bao'anDistrict, Shenzhen 518000, P.R.China

2.4.3. Test facility:

JAN 01, 2012 File on Federal Communication Commission
Registration Number:177635

September 11, 2011 Certificated by IC
Registration Number: 8513 B

2.5. Measurement Uncertainty

(95% confidence levels, k=2)

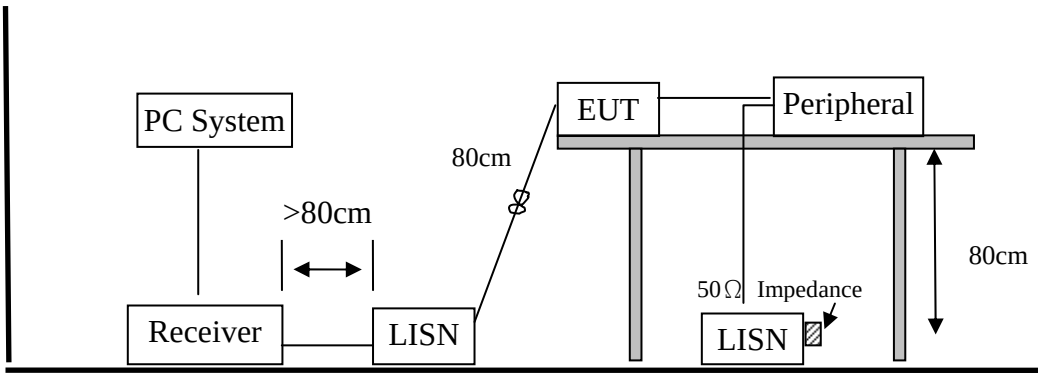
Test Item	Uncertainty
Uncertainty for Conduction emission test	2.50dB
Uncertainty for Radiation Emission test	3.04 dB (Distance: 3m Polarize: V)
	3.02 dB (Distance: 3m Polarize: H)
Uncertainty for Radiation Emission test (1GHz-18GHz)	3.56 dB (Distance: 3m Polarize: V)
	3.84 dB (Distance: 3m Polarize: H)

3. POWER LINE CONDUCTED EMISSION TEST

3.1. Test Equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESCI	100843	Sep.25, 13	1 Year
2.	L.I.S.N.#1	Schwarzbeck	NSLK8126	8126466	Sep.25, 13	1 Year
3.	L.I.S.N.#2	Kyoritsu	KNW-242C	8-1920-1	Sep.25, 13	1 Year
4.	Terminator	Hubersuhner	50Ω	No. 1	Sep.25, 13	1 Year
5.	RF Cable	Schwarzbeck	9111505/200	5995-12-16 1-6890#	Sep.25, 13	1 Year
6.	Coaxial Switch	Schwarzbeck	CX-210	N/A	Sep.25, 13	1 Year
7.	Pulse Limiter	Schwarzbeck	VTSD9516F	9618	Sep.25, 13	1 Year

3.2. Block Diagram of Test Setup



3.3. Power Line Conducted Emission Test Limits

Frequency	Maximum RF Line Voltage	
	Quasi-Peak Level dB(μV)	Average Level dB(μV)
150kHz ~ 500kHz	66 ~ 56*	56 ~ 46*
500kHz ~ 5MHz	56	46
5MHz ~ 30MHz	60	50

Notes: 1. Emission level=Read level+LISN factor-Preamp factor+Cable loss
2* Decreasing linearly with logarithm of frequency.
3. The lower limit shall apply at the transition frequencies.

3.4. Configuration of EUT on Test

The following equipment are installed on Power Line Conducted Emission Test to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

3.5. Operating Condition of EUT

3.5.1. Setup the EUT and simulator as shown as Section 3.2.

3.5.2. Turn on the power of all equipment.

3.5.3. Let the EUT work in test mode (ON) and 15 minutes after taking the test.

3.6. Test Procedure

The EUT was placed on a non-metallic table, 80cm above the ground plane. The EUT Power connected to the power mains through a line impedance stabilization network (L.I.S.N. 1#). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N. #2), this provided a 50-ohm coupling impedance for the EUT (Please refer to the block diagram of the test setup and photographs). Both sides of power line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4-2003 on conducted Emission test.

The bandwidth of test receiver (R&S TEST RECEIVER ESCI) is set at 10kHz.

The frequency range from 150kHz to 30MHz is checked. The test result are reported on Section 3.7.

3.7. Conducted Disturbance at Mains Terminals Test Results

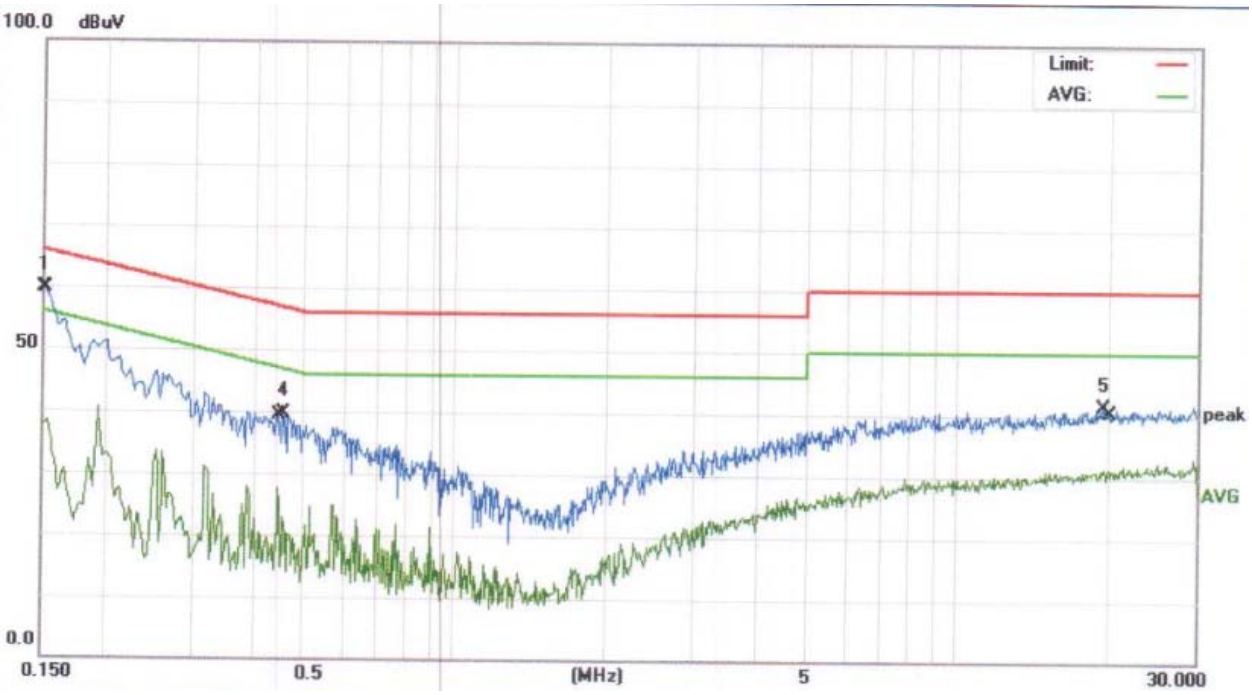
PASS. (All emissions not reported below are too low against the prescribed limits.)

The EUT with the following test mode was tested and read QP values and AVG values, the test results are listed in next pages.

Temperature: 24℃ Humidity: 56%

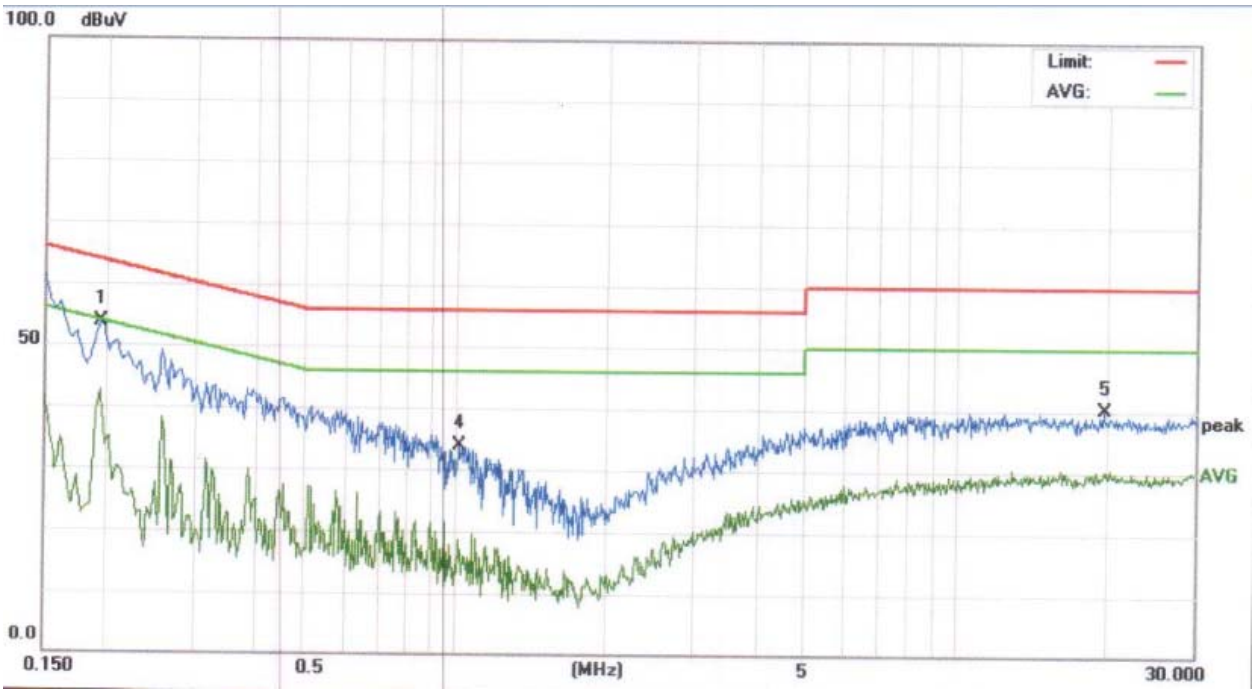
The details of test mode is as follows：

No.	Test Mode
1.	ON



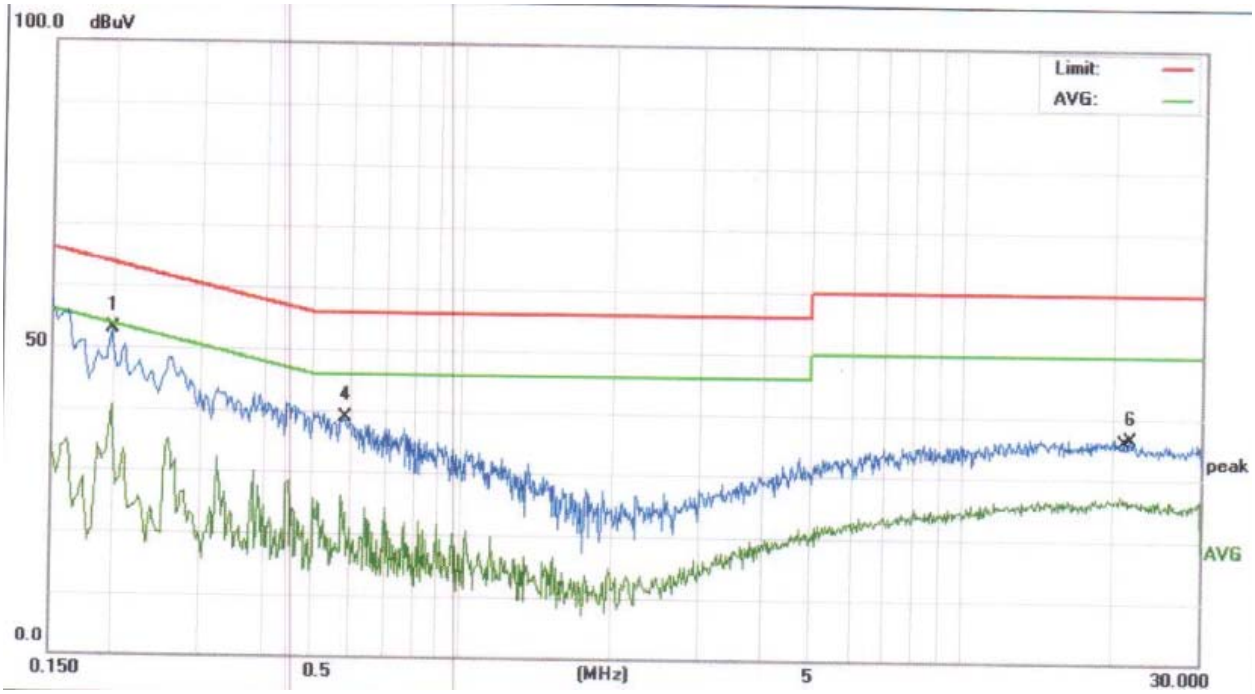
Limit: FCC PART 15 B QP Phase: Line

Frequency (MHz)	Meter Reading (dBµV)	Factor(dB)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Detector
*0.1500	47.81	11.94	59.75	65.99	-6.24	Quasi-Peak
0.1539	26.46	11.84	38.30	55.78	-17.48	Average
0.4540	29.57	10.06	39.63	56.80	-17.17	Quasi-Peak
0.4460	17.61	10.07	27.68	46.95	-19.27	Average
19.4460	39.47	1.97	41.44	60.00	-18.56	Quasi-Peak
19.9780	29.30	2.04	31.34	50.00	-18.66	Average



Limit: FCC PART 15 B QP Phase: Neutral

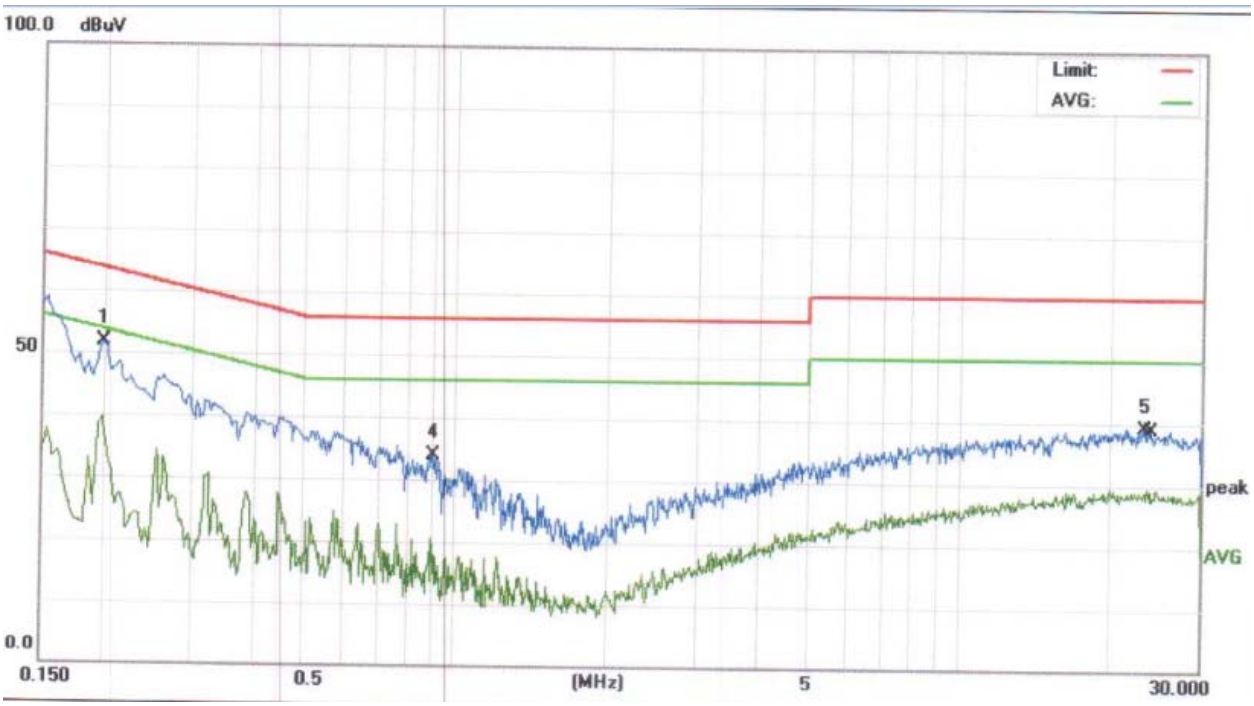
Frequency (MHz)	Meter Reading (dBµV)	Factor(dB)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Detector
*0.1940	42.38	11.21	53.59	63.86	-10.27	Quasi-Peak
0.1940	31.35	11.21	42.56	53.86	-11.30	Average
1.0180	24.05	9.94	33.99	56.00	-22.01	Quasi-Peak
1.0140	8.79	9.94	18.73	46.00	-27.27	Average
19.6740	38.02	2.00	40.02	60.00	-19.98	Quasi-Peak
19.7780	28.04	2.01	30.05	50.00	-19.95	Average



Limit: FCC PART 15 B QP Phase: Neutral

Frequency (MHz)	Meter Reading (dBµV)	Factor(dB)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Detector
*0.1980	41.73	11.16	52.89	63.69	-10.80	Quasi-Peak
0.1980	29.58	11.16	40.74	53.69	-12.95	Average
0.5820	28.83	10.00	38.83	56.00	-17.17	Quasi-Peak
0.5740	16.21	10.00	26.21	46.00	-19.79	Average
21.7139	34.33	2.07	36.40	60.00	-23.60	Quasi-Peak
21.0419	24.86	2.06	26.92	50.00	-23.08	Average

Remark:



Limit: FCC PART 15 B QP Phase: Line

Frequency (MHz)	Meter Reading (dBµV)	Factor(dB)	Emission Level (dBµV)	Limits (dBµV)	Margin (dB)	Detector
*0.1980	40.58	11.16	51.74	63.69	-11.95	Quasi-Peak
0.1980	28.38	11.16	39.54	53.69	-14.15	Average
0.9020	24.05	9.94	33.99	56.00	-22.01	Quasi-Peak
0.8900	10.67	9.93	20.60	46.00	-25.40	Average
23.2180	37.05	2.09	39.14	60.00	-20.86	Quasi-Peak
23.5300	27.30	2.10	29.40	50.00	-20.60	Average

Remark:

4. RADIATED EMISSION TEST

4.1. Test Equipment

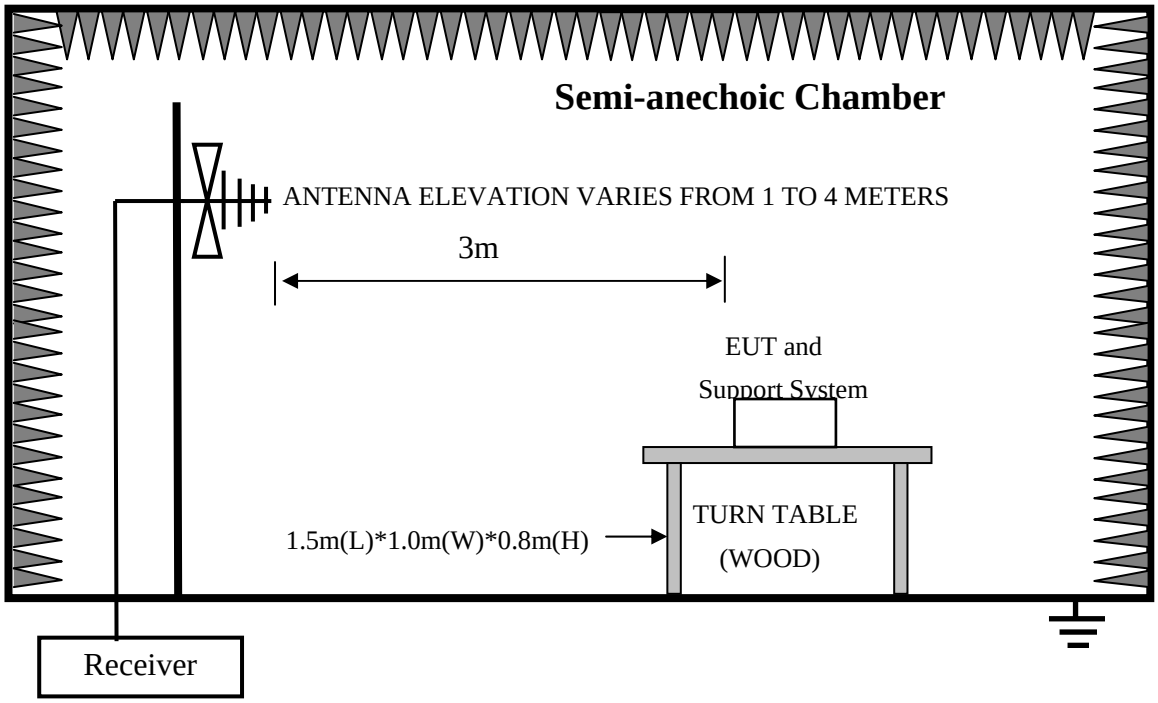
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Test Receiver	Rohde&Schwarz	ESCI	101165	Sep.25, 13	1 Year
2	Amplifier	Schwarzbeck	BBV9743	9743-019	Sep.25, 13	1 Year
3	Bilog Antenna	Schwarzbeck	VULB 9168	9168-438	Sep.25, 13	1 Year
4	RF Cable	Schwarzbeck	AK9515E	95891-2m	Sep.25, 13	1 Year
5	RF Cable	Schwarzbeck	AK9515E	95891-11m	Sep.25, 13	1 Year
6	RF Cable	Schwarzbeck	AK9515E	95891-0.5m	Sep.25, 13	1 Year

For frequency range 1GHz~5GHz (At Semi Anechoic Chamber)

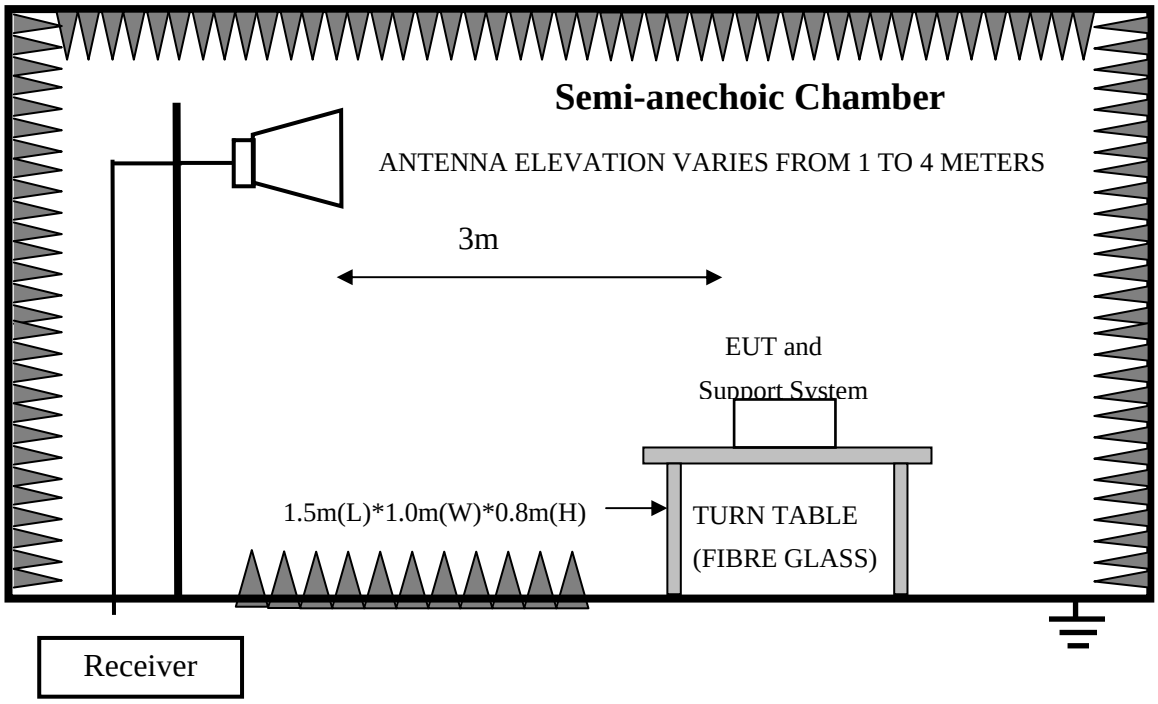
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	Spectrum Analyzer	Agilent	E4407B	MY49510055	Sep.25, 13	1 Year
2	Horn Antenna	Schwarzbeck	BBHA 9120 D	BBHA 9120 D(1201)	Sep.25, 13	1 Year
3	Amplifier	Quietek	AP-180C	CHM-0602012	Sep.25, 13	1 Year
4	RF Cable	Resenberger	Cable 4	N/A	Sep.25, 13	1 Year
5	RF Cable	Resenberger	Cable 5	N/A	Sep.25, 13	1 Year
6	RF Cable	Resenberger	Cable 6	N/A	Sep.25, 13	1 Year

4.2. Block Diagram of Test Setup

4.2.1. In Semi Anechoic Chamber (3m) Test Setup Diagram for 30MHz~1000MHz



4.2.2. In Semi Anechoic Chamber (3m) Test Setup Diagram for 1-5GHz



4.3. Radiated Emission Limit

Frequency MHz	Distance (Meters)	Field Strengths Limits dB(μV)/m
30 ~ 88	3	40.0
88 ~ 216	3	43.5
216 ~ 960	3	46.0
960 ~ 1000	3	54.0
1000 ~ 5000	3	74(Peak) 54(Average)

Remark: (1) Emission level = Read level+Antenna Factor-Preamp Factor +Cable Loss

(2) The smaller limit shall apply at the cross point between two frequency bands.

(3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

4.4. EUT Configuration on Test

The following equipment are installed on Radiated Emission Test to meet the commission requirements and operating regulations in a manner that tends to maximize its emission characteristics in normal application.

4.4.1. Support Equipments : As Tested Supporting System Detail, in Section 2.2.

4.5. Operating Condition of EUT

4.5.1.Setup the EUT as shown in Section 4.2.

4.5.2.Turn on the power of all equipment.

4.5.3.Let the EUT work in test mode (ON) and 15 minutes after taking the test.

4.6. Test Procedure

The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber. An antenna was located 3m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT were rotated and the antenna height was varied between 1m and 4m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to ANSI C63.4-2003 on Radiated Emission test.

The bandwidth setting on the test receiver (ROHDE&SCHWARZ TEST RECEIVER ESCI) is 120 kHz.

The resolution bandwidth of the Agilent Spectrum Analyzer E4446A was set at 1MHz. (For above 1GHz)

The frequency range from 30MHz to 1000MHz was pre-scanned with a peak

detector and all final readings of measurement from Test Receiver are Quasi-Peak values.

The frequency range from 1GHz to 5GHz was checked with peak and average detector, measurement distance is 3m in 3m chamber.

Finally, selected operating situations at Anechoic Chamber measurement, all the test results are listed in section 4.7.

4.7. Radiated Disturbance Test Results

PASS. (All emissions not reported below are too low against the prescribed limits.)

For frequency range 30MHz~1000MHz

The EUT with the following test mode was tested and read Q.P values and average values, the test results are listed in next pages.

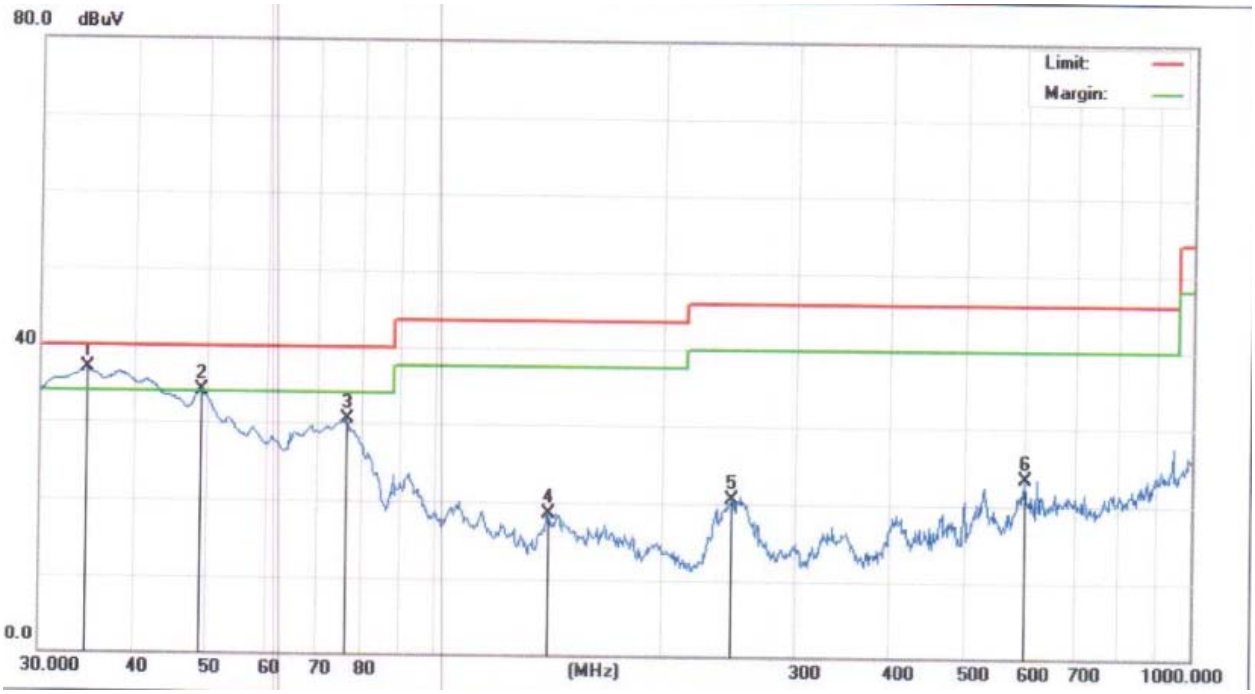
Temperature: 24.2℃ Humidity: 54%

The details of test mode is as follows：

No.	Test Mode
1.	ON

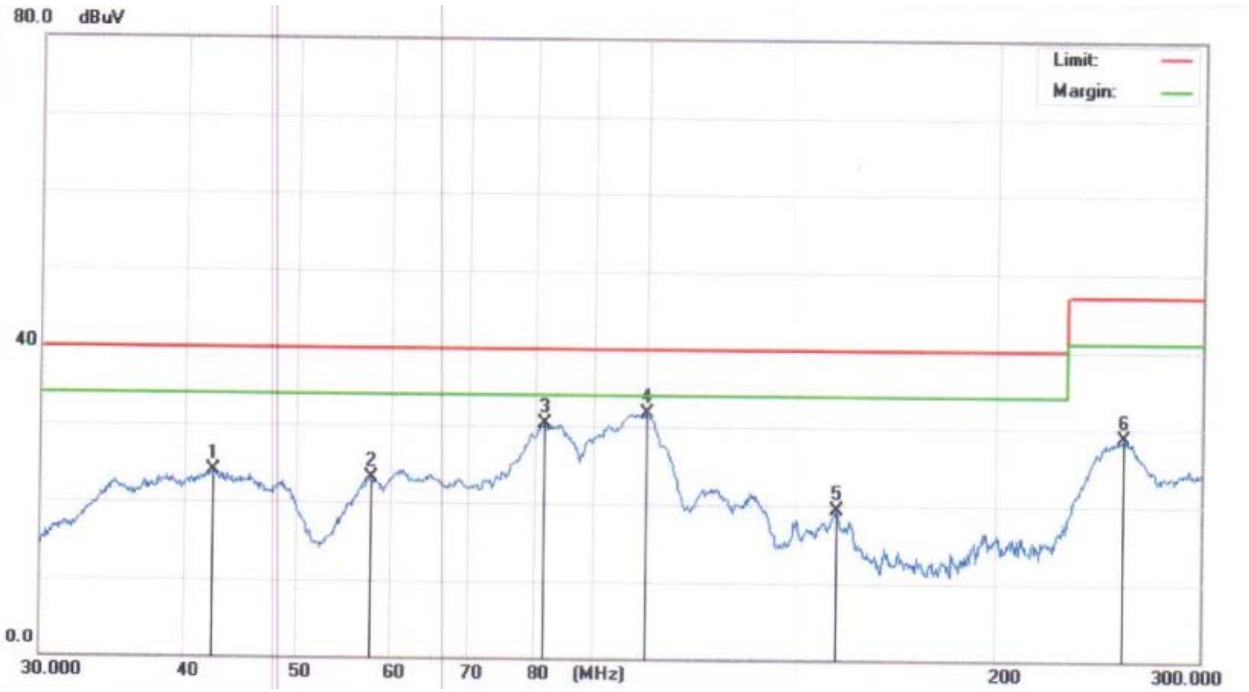
For frequency range 1GHz~5GHz

The highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. So the frequency rang 1GHz-5GHz radiation test not applicable.



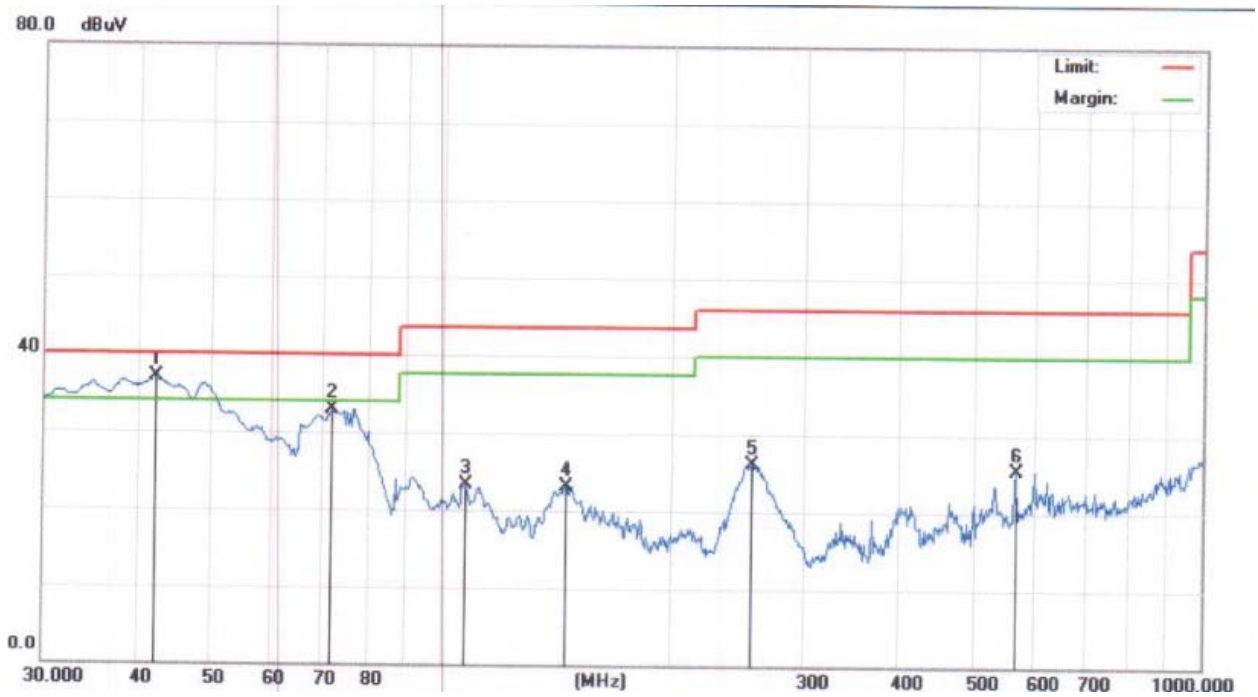
Limit: FCC PART 15 B (3m) Phase: Vertical

Frequency (MHz)	Reading Level (dBµV)	Factor(dB)	Measurement (dBµV)	Limits (dBµV)	Margin (dB)	Detector
34.5173	54.15	-17.29	36.86	40.00	-3.14	Quasi-Peak
48.8429	49.24	-15.22	34.02	40.00	-5.98	Quasi-Peak
76.2442	48.54	-17.98	30.56	40.00	-9.44	Quasi-Peak
141.3298	35.51	-16.94	18.57	43.50	-24.93	Quasi-Peak
245.9509	31.84	-11.25	20.59	46.00	-25.41	Quasi-Peak
601.4265	24.85	-1.55	23.30	46.00	-22.70	Quasi-Peak



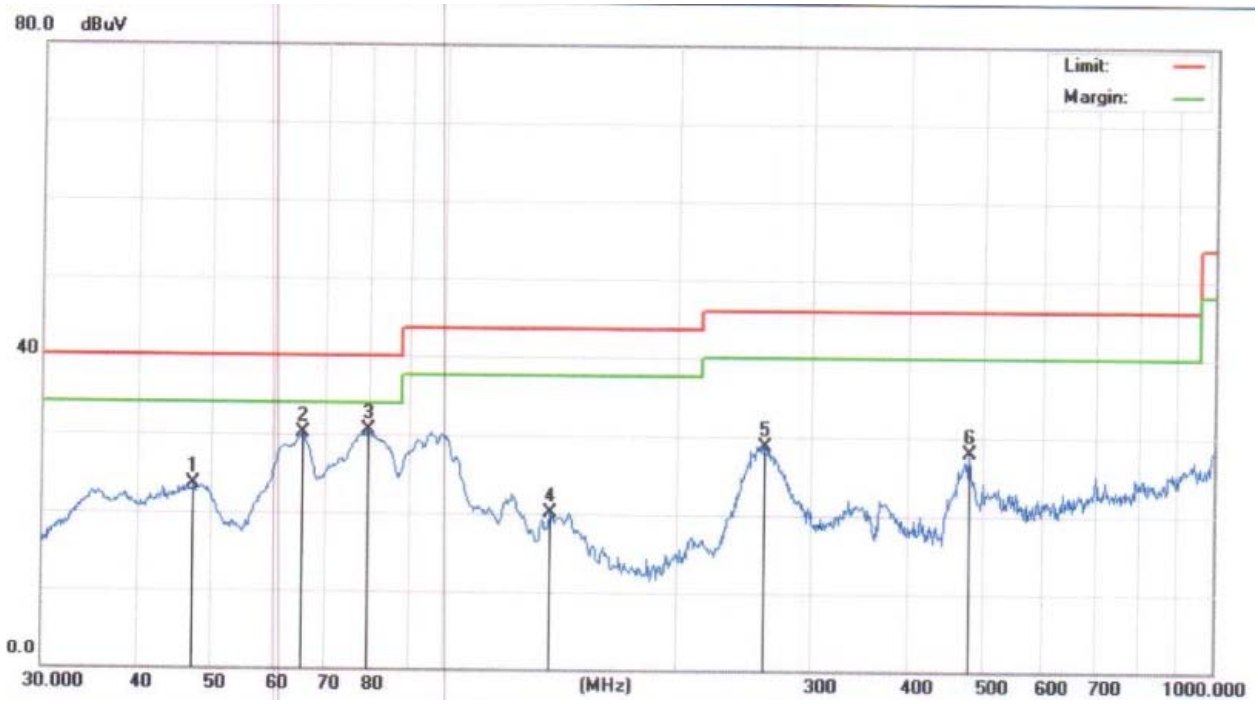
Limit: FCC PART 15 B (3m) Phase: Horizontal

Frequency (MHz)	Reading Level (dBµV)	Factor(dB)	Measurement (dBµV)	Limits (dBµV)	Margin (dB)	Detector
42.1814	36.45	-12.60	23.85	40.00	-16.15	Quasi-Peak
57.8256	39.17	-16.13	23.04	40.00	-16.96	Quasi-Peak
81.4932	48.13	-17.88	30.25	40.00	-9.75	Quasi-Peak
99.7979	47.48	-15.81	31.67	40.00	-8.33	Quasi-Peak
145.5866	36.38	-17.10	19.28	40.00	-20.72	Quasi-Peak
257.1114	39.35	-10.74	28.61	47.00	-18.39	Quasi-Peak



Limit: FCC PART 15 B (3m) Phase: Horizontal

Frequency (MHz)	Reading Level (dBµV)	Factor(dB)	Measurement (dBµV)	Limits (dBµV)	Margin (dB)	Detector
42.0066	53.06	-16.14	36.92	40.00	-3.08	Quasi-Peak
71.8319	50.07	-17.11	32.96	40.00	-7.04	Quasi-Peak
107.5101	38.92	-15.56	23.36	43.50	-20.14	Quasi-Peak
145.8610	40.21	-17.10	23.11	43.50	-20.39	Quasi-Peak
255.6231	36.95	-10.77	26.18	46.00	-19.82	Quasi-Peak
568.6127	28.16	-2.90	25.26	46.00	-20.74	Quasi-Peak



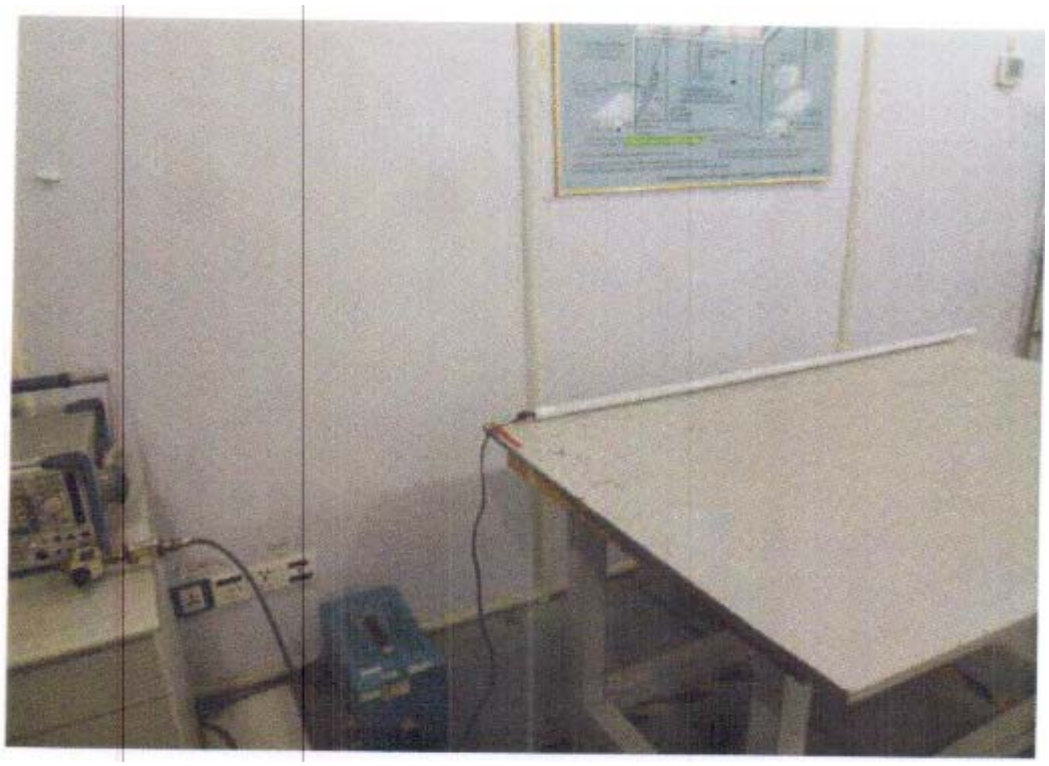
Limit: FCC PART 15 B (3m) Phase: Vertical

Frequency (MHz)	Reading Level (dBµV)	Factor(dB)	Measurement (dBµV)	Limits (dBµV)	Margin (dB)	Detector
47.1599	36.80	-13.34	23.46	40.00	-16.54	Quasi-Peak
65.3431	46.71	-16.67	30.04	40.00	-9.96	Quasi-Peak
79.5209	48.63	-18.04	30.59	40.00	-9.41	Quasi-Peak
137.4201	36.82	-16.80	20.02	43.50	-23.48	Quasi-Peak
260.1444	39.41	-10.67	28.74	46.00	-17.26	Quasi-Peak
480.5276	33.65	-5.80	27.85	46.00	-18.15	Quasi-Peak

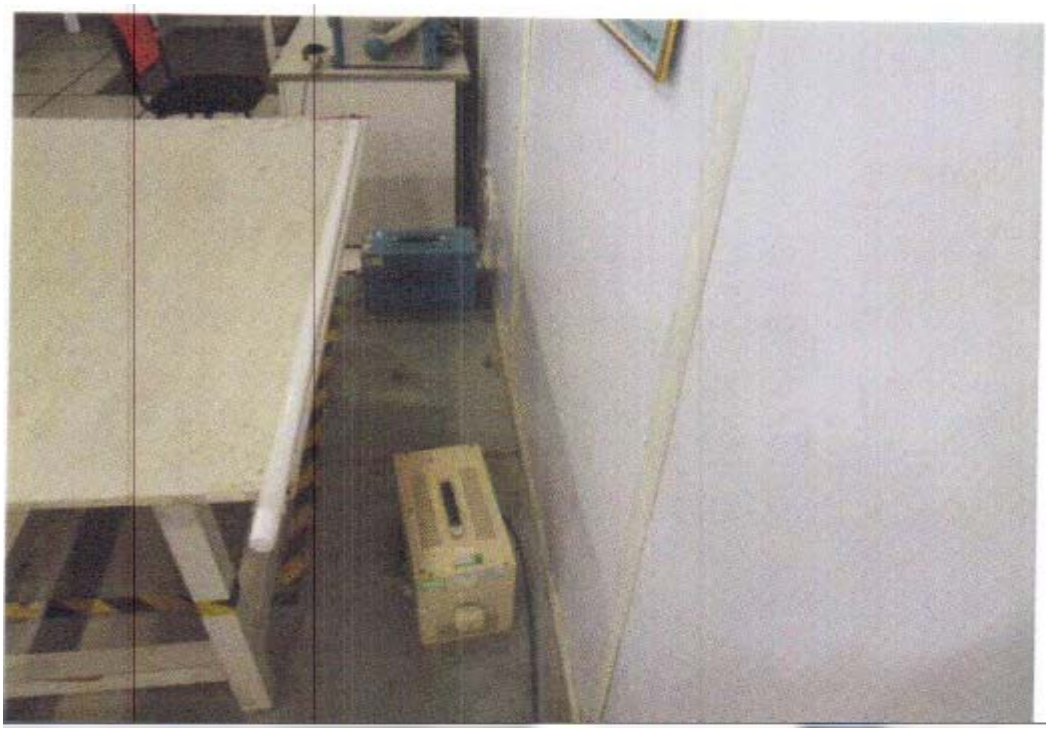
5. PHOTOGRAPH

5.1.Photos of Power Line Conducted Emission Test

UL-22W-220

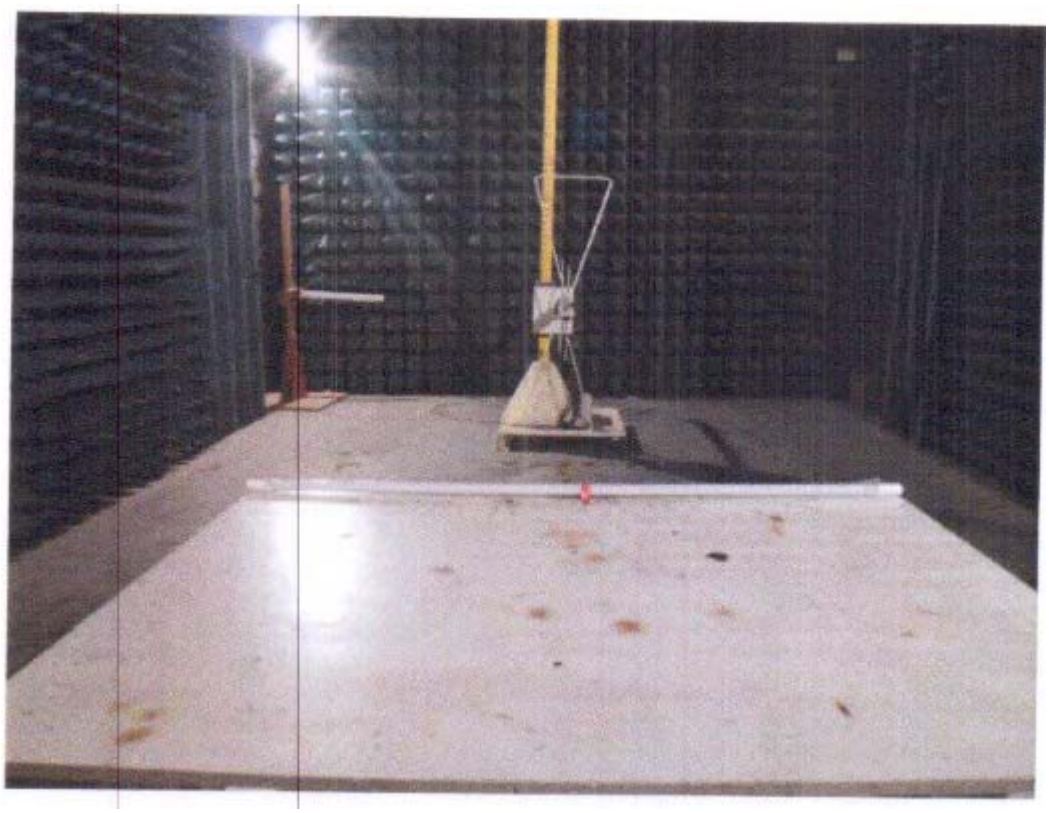


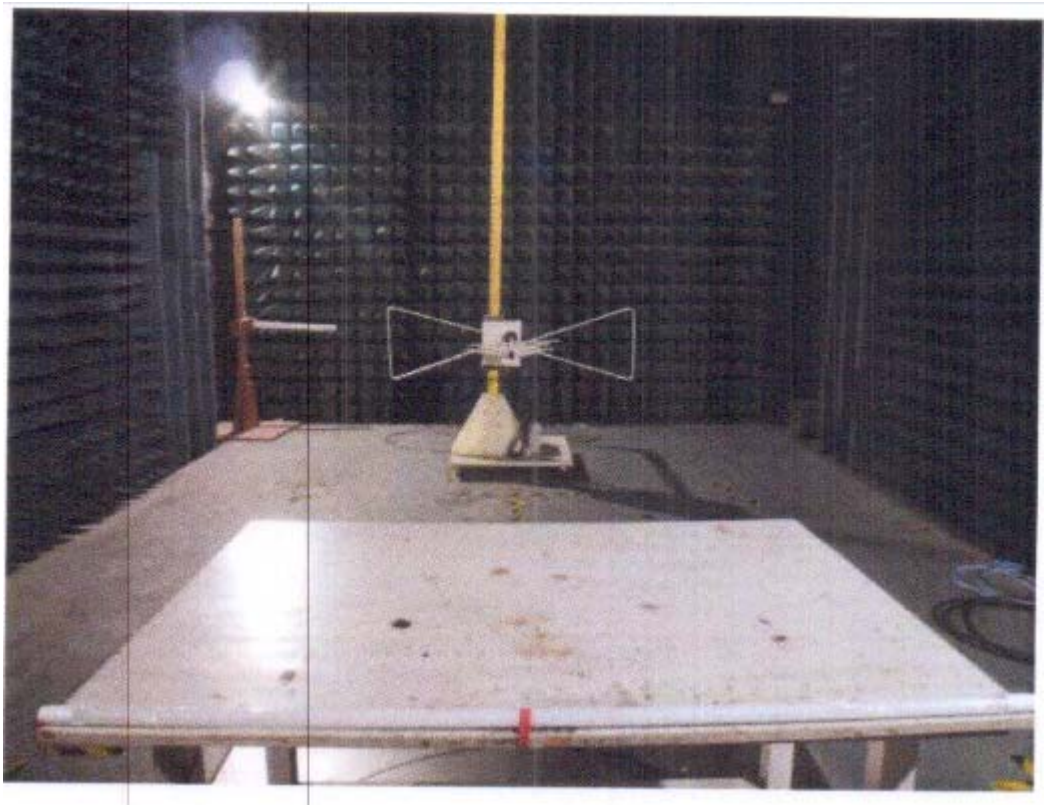
UL-22W-220



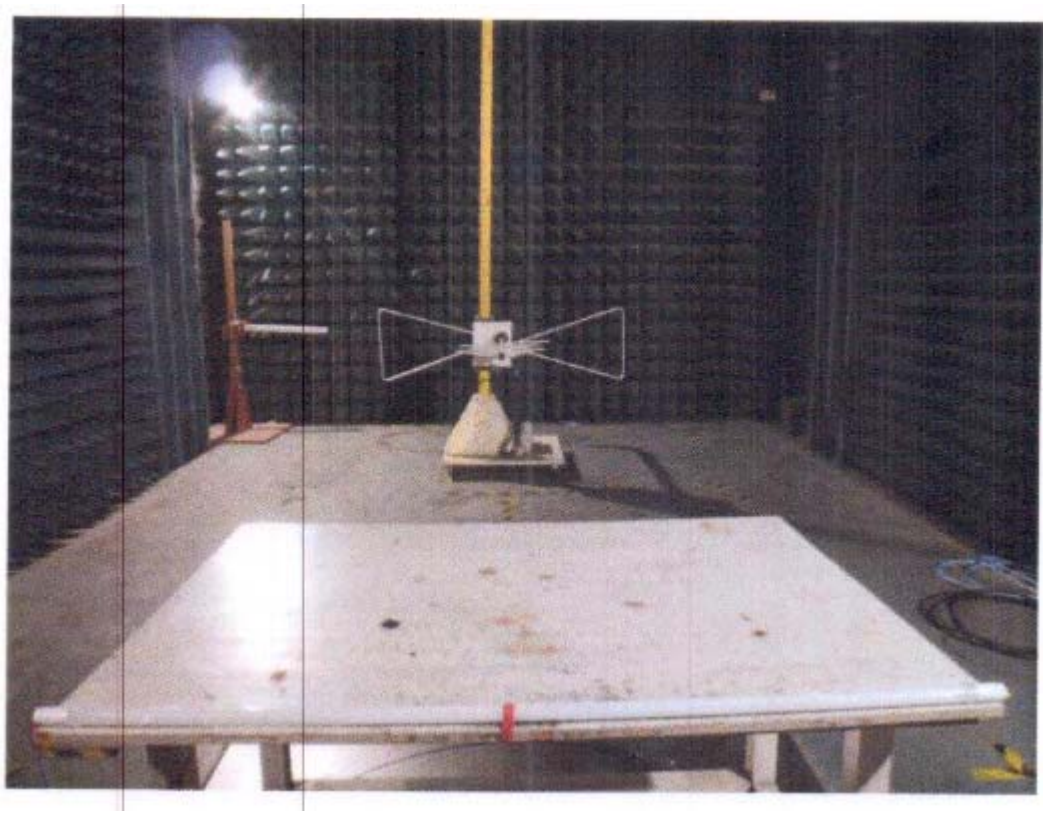
5.2.Photos of Radiated Emission Test (In Anechoic Chamber)

UL-22W-220





UQ-22W-220



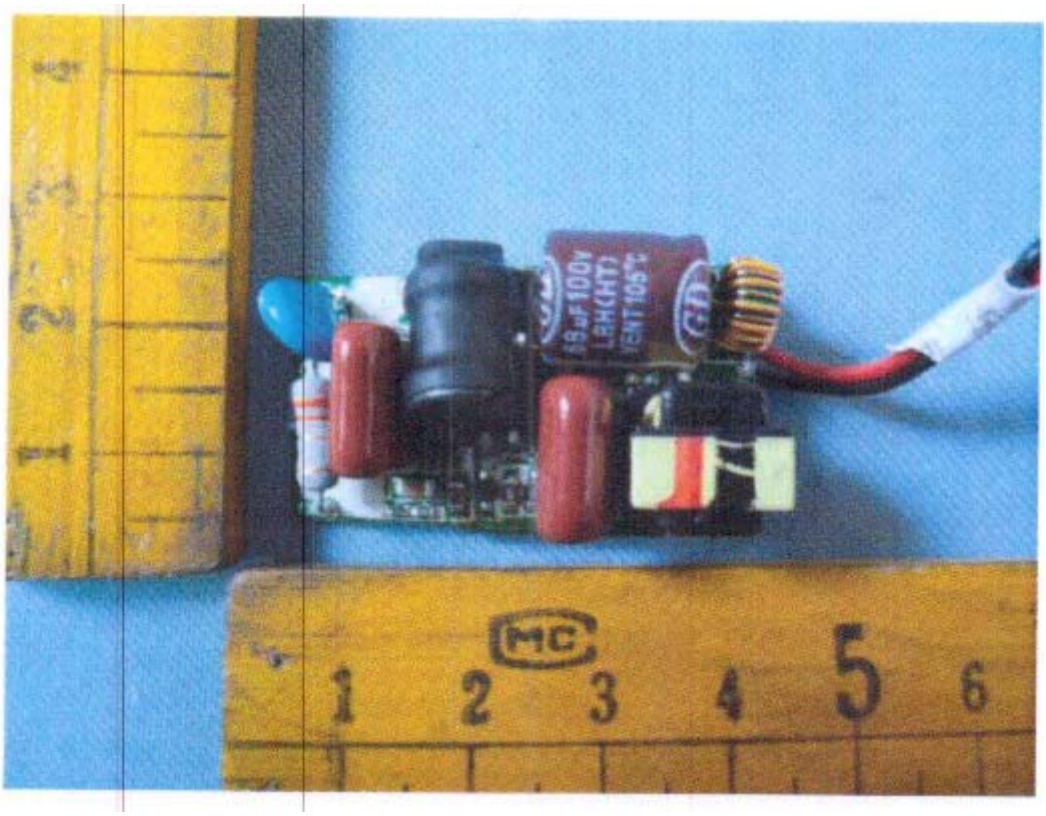
6. PHOTOS OF THE EUT

UL-22W-220

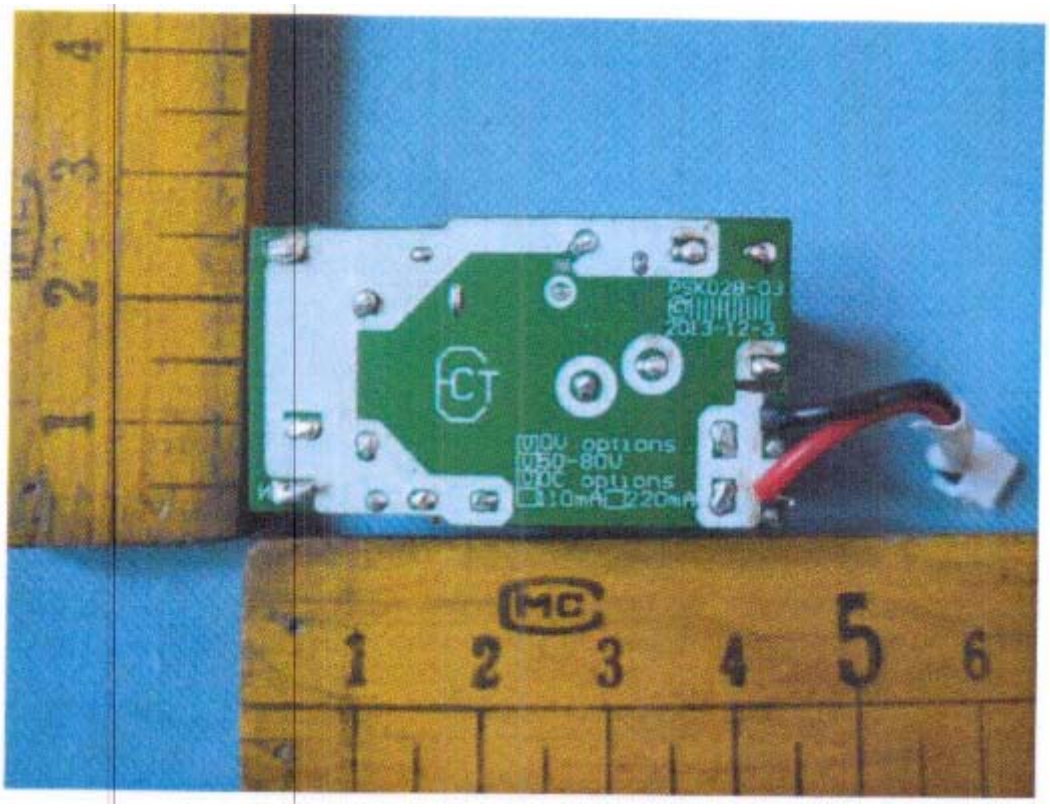
Front View

Rear View

Part View

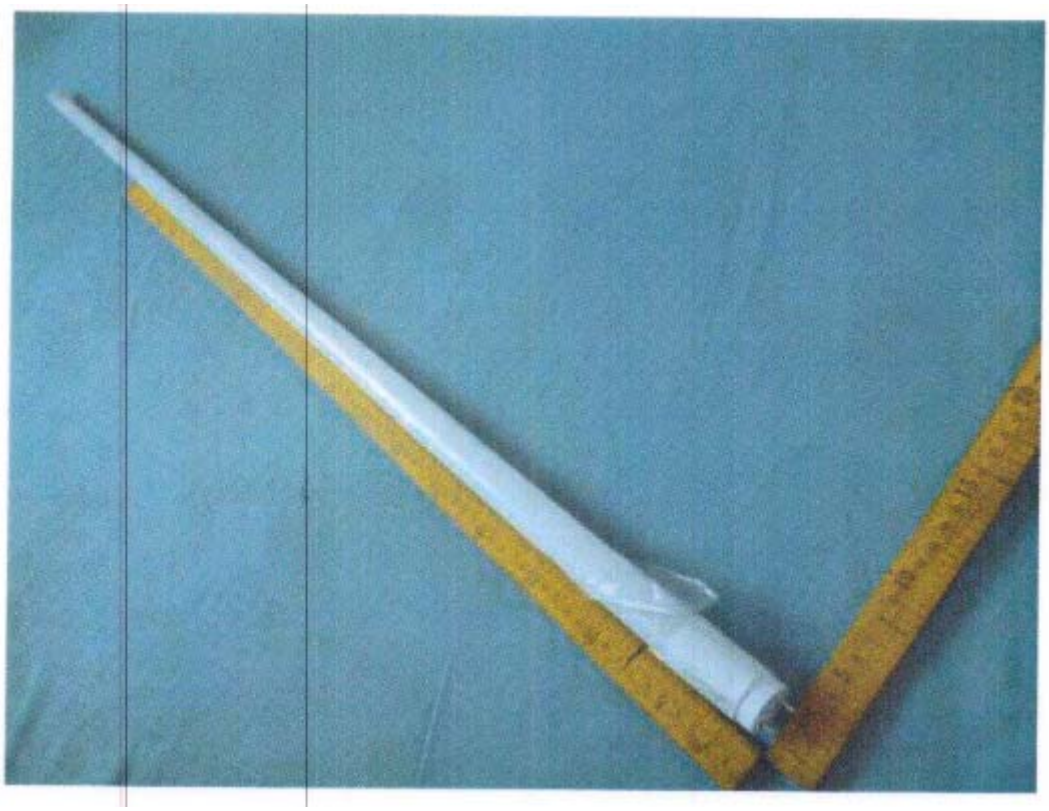


Inside View



Inside View

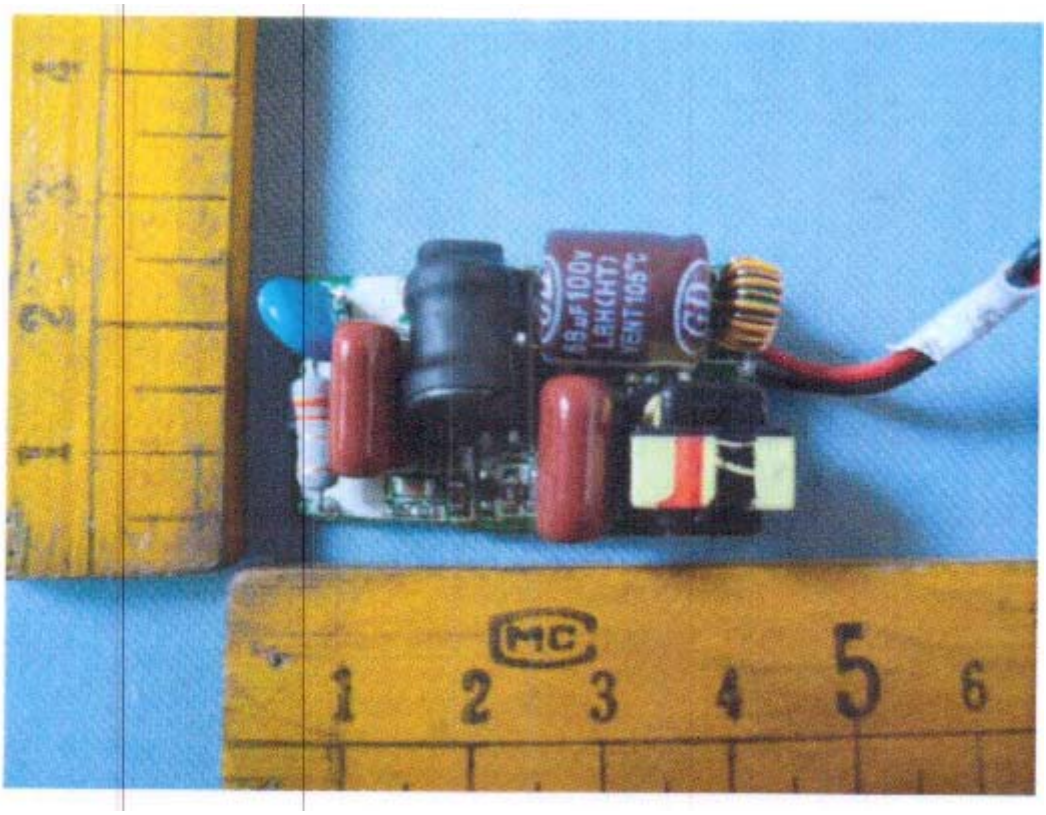
UQ-22W-220



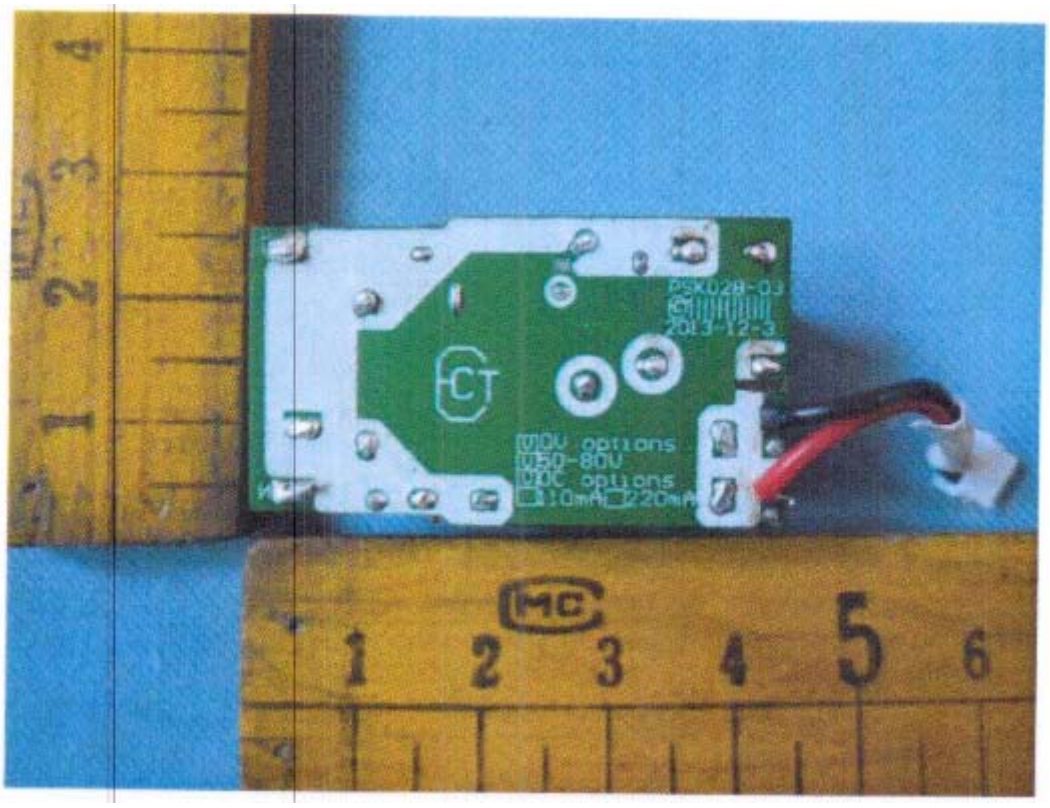
Front View

Rear View

Part View



Inside View



Inside View

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