

FCC TEST REPORT

FCC ID. : WZA-FC-505-FCC

Applicant : Zhong Shan Heng Sheng Logistic Co., Ltd.

Address : Luosan Industrial District, Fusha Town, Zhongshan, Guangdong, China

Manufacturer : Zhongshan Deyuan Electric Co., LTD

Address : Niao Jiao Industrial District, Fusha Town, Zhongshan, Guangdong, China

Equipment Under Test (EUT) :

Product Name : Touch Dimmer

Model No. : FC-504、FC-505、FC-505-2H、FC-505-3、FC-507

Standards : FCC Part 18 : 2010-10-1

Date of Test : May 21~25, 2012

Date of Issue : May 25, 2012

Test Engineer : Zero Zhou

Reviewed By : Philo zhong



Test Result :

PASS *

Prepared By:

Waltek Services (Shenzhen) Co., Ltd.

1/F, Fukangtai Building, West Baima Rd., Songgang Street, Baoan District,
Shenzhen 518105, China

Tel :+86-755-27553488
Fax:+86-755-27553868

* The sample detailed above has been tested to the requirements of Council Directives ANSI C63.4:2003. The test results have been reviewed against the Directives above and found to meet their essential requirements.

1 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission (30MHz to 1GHz)	FCC PART 18 : 2010-10-1	ANSI C63.4: 2003	Class B	PASS
Conducted Emission (450KHz to 30MHz)	FCC PART 18 : 2010-10-1	ANSI C63.4: 2003	Class B	PASS

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3 General Information

3.1 General Description of E.U.T.

Product Name : Touch Dimmer
 Model No.: FC-504、FC-505、FC-505-2H、FC-505-3、FC-507
 Model Difference : all the models used the same PCB, difference is the output connect line and output power

3.2 Details of E.U.T.

Technical Data: Input: 120VAC /60Hz
 Output: 12VDC,Max 300W

3.3 Description of Support Units

The EUT has been tested as an independent unit. All the test was performed in the condition of AC 120V/60Hz input.

3.4 Standards Applicable for Testing

The customer requested FCC tests for a Touch Dimmer. The standards used were FCC PART 18.

3.5 Test Facility

The test facility has a test site registered with the following organizations:

- **IC – Registration No.: IC7760A**

Waltek Services(Shenzhen) Co., Ltd. has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration IC7760A, Aug.03, 2010.

- **FCC – Registration No.: 880581**

Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 880581, May 26, 2011.

3.6 Test Location

All the tests were performed at:-
 Waltek Services(Shenzhen) Co., Ltd. at 1/F, Fukangtai Building, West Baima Rd., Songgang Street, Baoan District, Shenzhen, China

4 Equipment Used during Test

Conducted Emission					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1	Test Receiver	ROHDE&SCHWA RZ	ESCI	101155	Valid
2	Two-Line V-Network	ROHDE&SCHWA RZ	ENV216	100115	Valid
3m Semi-anechoic Chamber for Radiation					
Item	Equipment	Manufacturer	Model No.	Serial No.	Calibration Status
1	EMC Analyzer	Agilent	E7405A	MY45114943	Valid
2	Trilog Broadband Antenne	SCHWARZBECK	VULB9163	336	Valid
3	Broad-bandHorn Antenna	SCHWARZBECK	VULB9163	667	Valid
4	Broadband Preamplifier	SCHWARZBECK	BBV 9718	9718-148	Valid
5	10m Coaxia Cable with N- plug	SCHWARZBECK	AK 9515 H	-	Valid
6	10m 50 Ohm Coaxial Cable with N-plug	SCHWARZBECK	AK 9513	-	Valid
7	Positioning Controller	C&C LAB	CC-C-IF	-	Valid
8	Color Monitor	SUNSPO	SP-14C	-	Valid

4.1 Measurement Uncertainty

Test Item	Frequency Range	Uncertainty	Note
Conduction disturbance	150kHz~30MHz	±3.64dB	(1)
Radiation	30MHz~1000MHz	±5.03dB	(1)

(1)This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

5 Emissions Test Results

5.1 Conducted Emission Data

Test Requirement:	FCC Part 18 :2010-10-1
Test Method:	Based on ANSI C63.4:2003
Frequency Range:	450kHz to 30MHz
Class:	Class B
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak & Average if maximised peak within 6dB of Average Limit

5.1.1 Test Equipment

Please refer to Section 4 this report.

5.1.2 Test Procedure

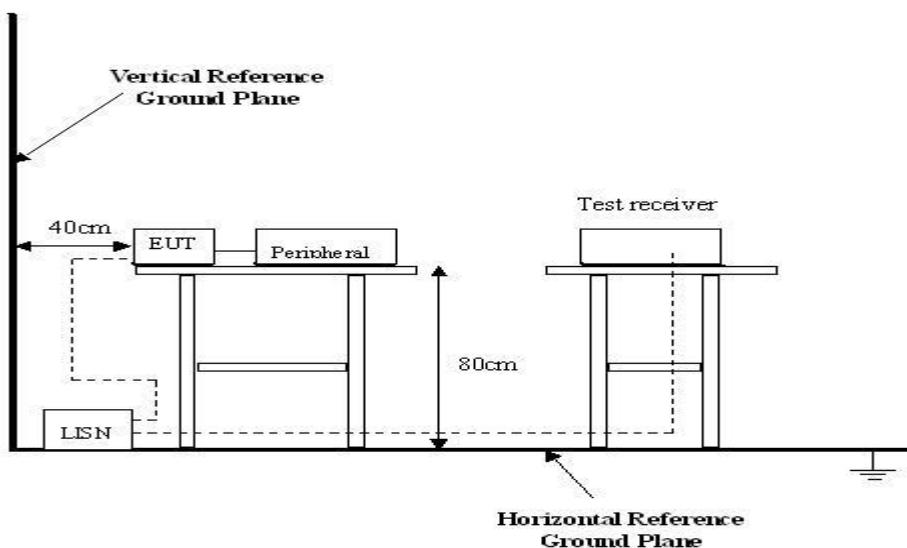
1. During the conducted emission test, the power cord of the EUT is connected to the auxiliary outlet of the LISN.
2. The EUT was tested according to FCC MP-5. The frequency spectrum from 450kHz to 30MHz was investigated.
3. The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

5.1.3 Conducted Test Setup

The conducted emission tests were performed using the setup accordance with the FCC MP-5 measurement procedure.

The EUT is tested independently.

The power supply used by the EUT is connected to a 120VAC / 60Hz power source.

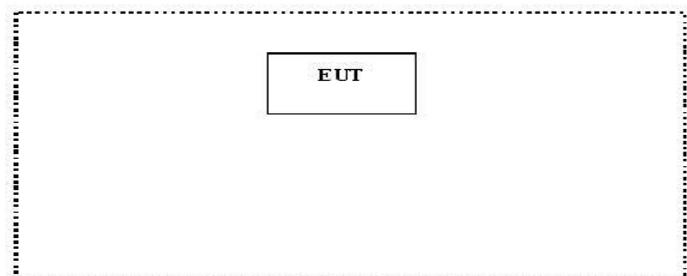


The EUT was placed on the test table in ON mode.

5.1.4 EUT Operating Condition

Operating condition is according to FCC MP-5.

- Setup the EUT and simulators as shown on follow.
- Enable RF signal and confirm EUT active.
- Modulate output capacity of EUT up to specification.



5.1.5 Conducted Emission Limits

Frequency of Emission (MHz)	Conducted Limit (dBuV)- Quasi-peak
0.45— 2.51	48
2.51 — 3.0	69.54
3.0 — 30	48

Note: In the above limits, the tighter limit applies at the band edges.

5.1.6 Spectrum Analyzer

The spectrum analyzer is configured during the conduction test is as follows:

.....Start Frequency.....	450 kHz
.....Stop Frequency.....	30 MHz
.....Sweep Speed.....	Auto
.....IF Bandwidth.....	9 kHz
.....Video Bandwidth.....	100 kHz
Quasi-Peak Adaptor Bandwidth.....	9 kHz
Quasi-Peak Adaptor Mode.....	Normal

5.1.7 Conducted Emission Test Result

Test Item:	Conducted Emission Test
Test Voltage:	120VAC / 60Hz
Test Mode:	Normal
Temperature:	25.5 °C
Humidity:	51%RH
Test Result:	PASS

5.1.8 Measurement Data

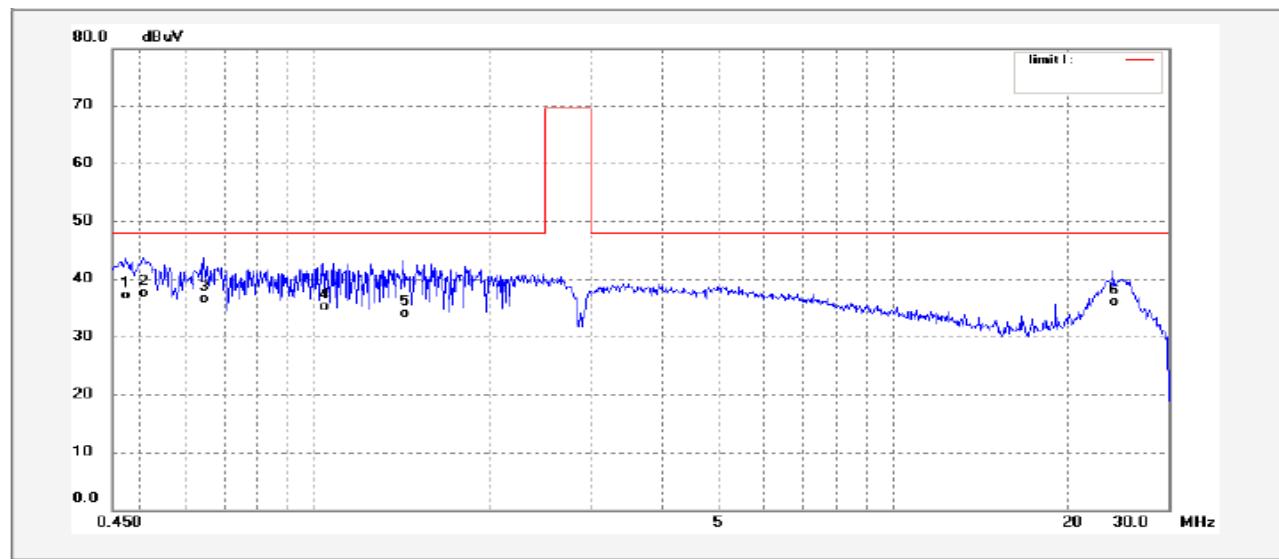
An initial pre-scan was performed on the live and neutral lines.

No further quasi-peak or average measurements were performed since no peak emissions were detected within 10dB line below the average limit.

Please refer to the following peak scan graph for reference.

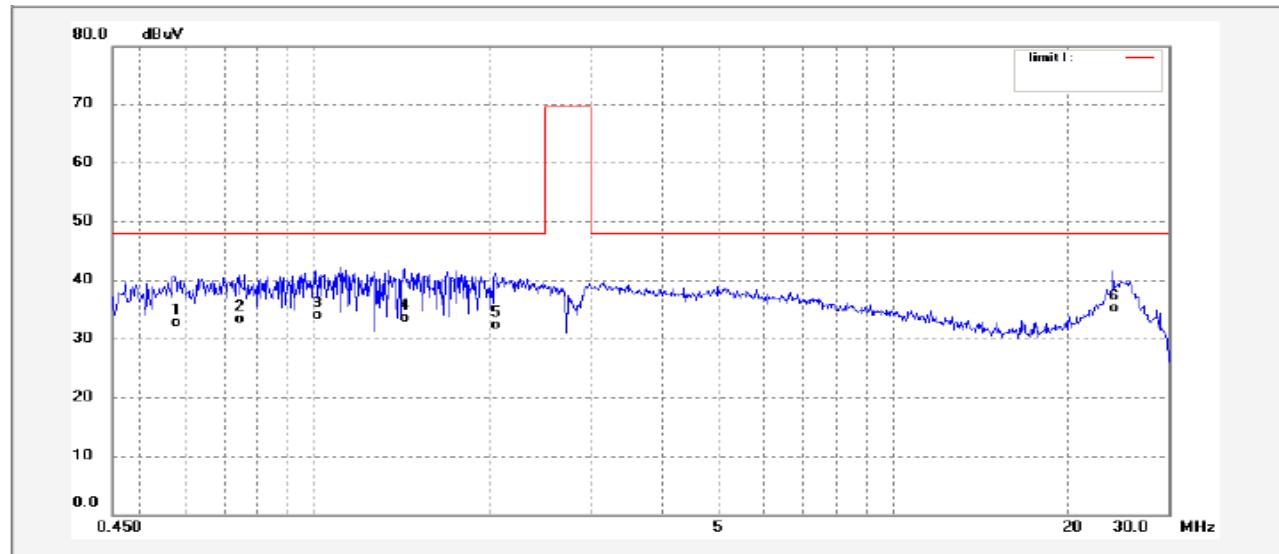
Low mode:

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.4740	25.99	10.39	36.38	48.00	-11.62	QP	
2	0.5100	26.24	10.40	36.64	48.00	-11.36	QP	
3	0.6460	25.24	10.42	35.66	48.00	-12.34	QP	
4	1.0420	23.75	10.46	34.21	48.00	-13.79	QP	
5	1.4340	22.60	10.56	33.16	48.00	-14.84	QP	
6	24.1140	23.97	11.21	35.18	48.00	-12.82	QP	

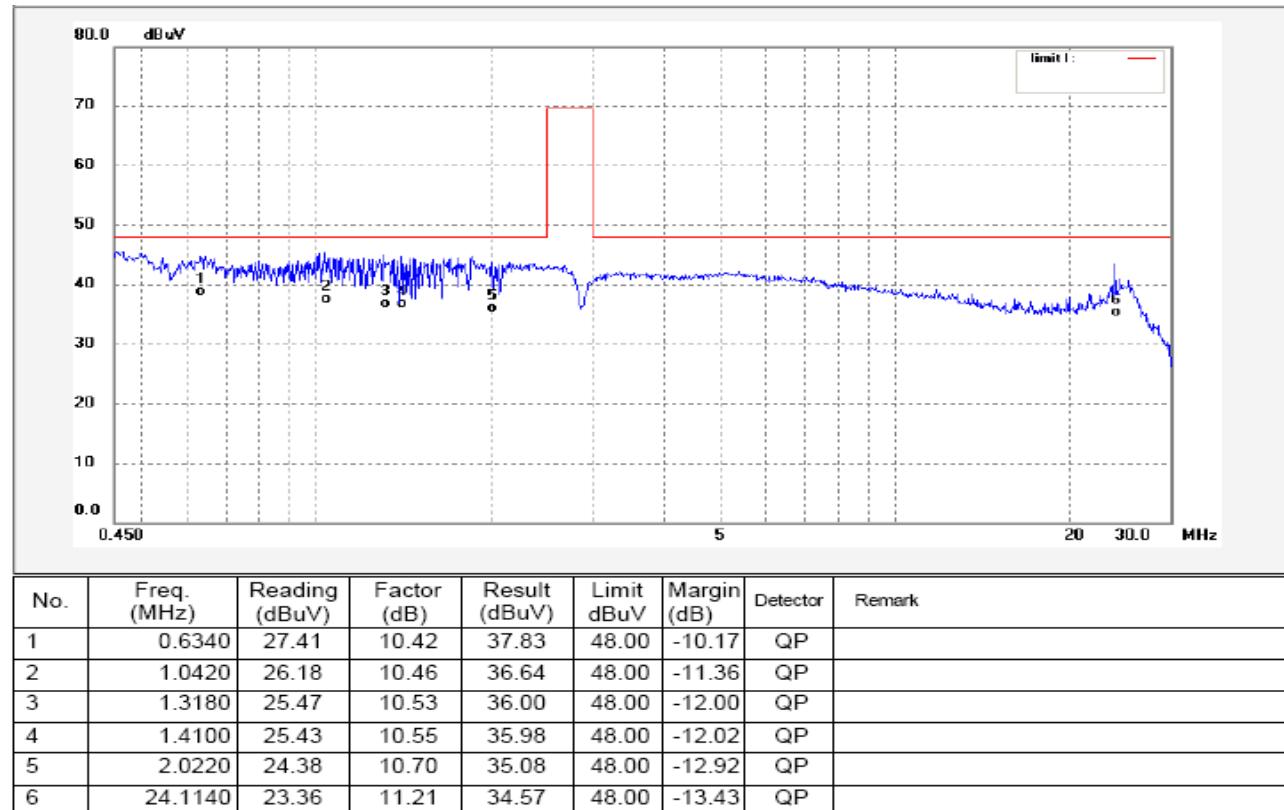
Neutral line:



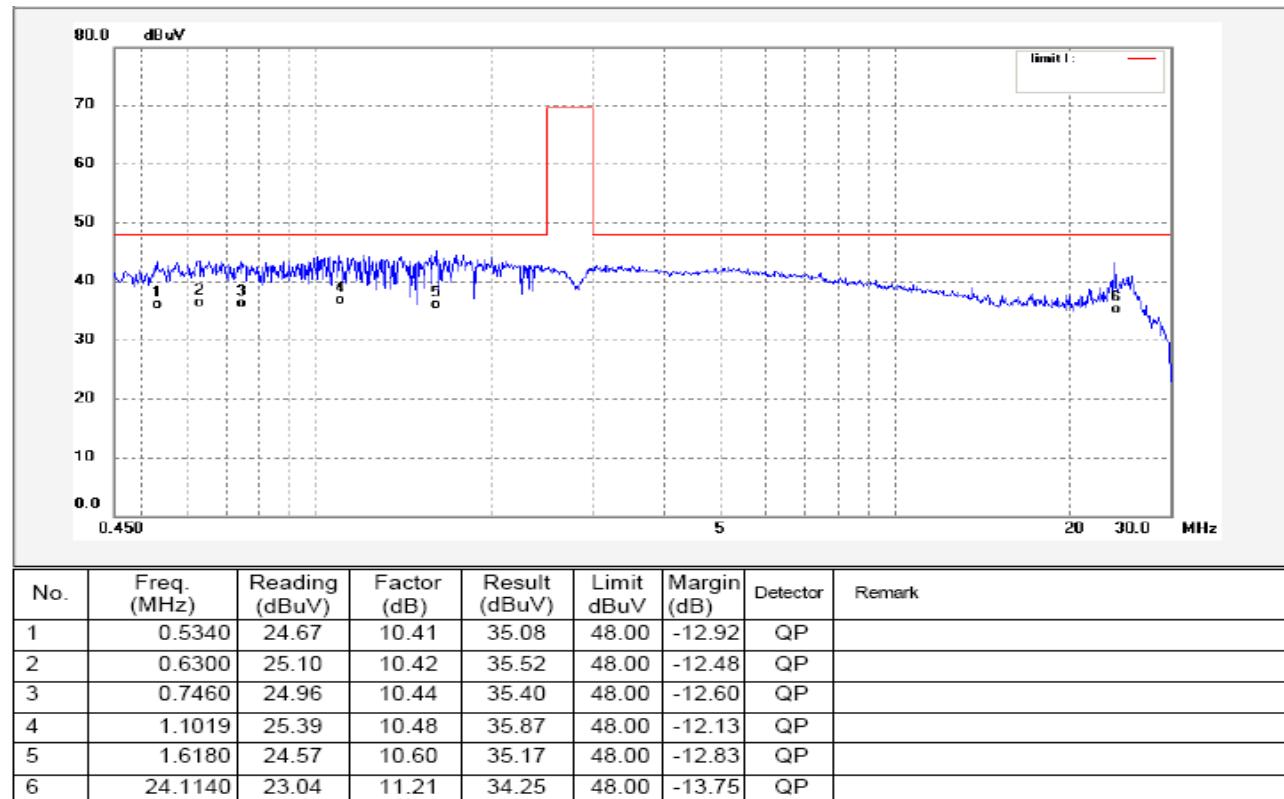
No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.5780	21.46	10.41	31.87	48.00	-16.13	QP	
2	0.7420	22.09	10.44	32.53	48.00	-15.47	QP	
3	1.0140	22.64	10.45	33.09	48.00	-14.91	QP	
4	1.4380	22.21	10.56	32.77	48.00	-15.23	QP	
5	2.0660	20.78	10.70	31.48	48.00	-16.52	QP	
6	24.1140	23.15	11.21	34.36	48.00	-13.64	QP	

Middle mode:

Live line:

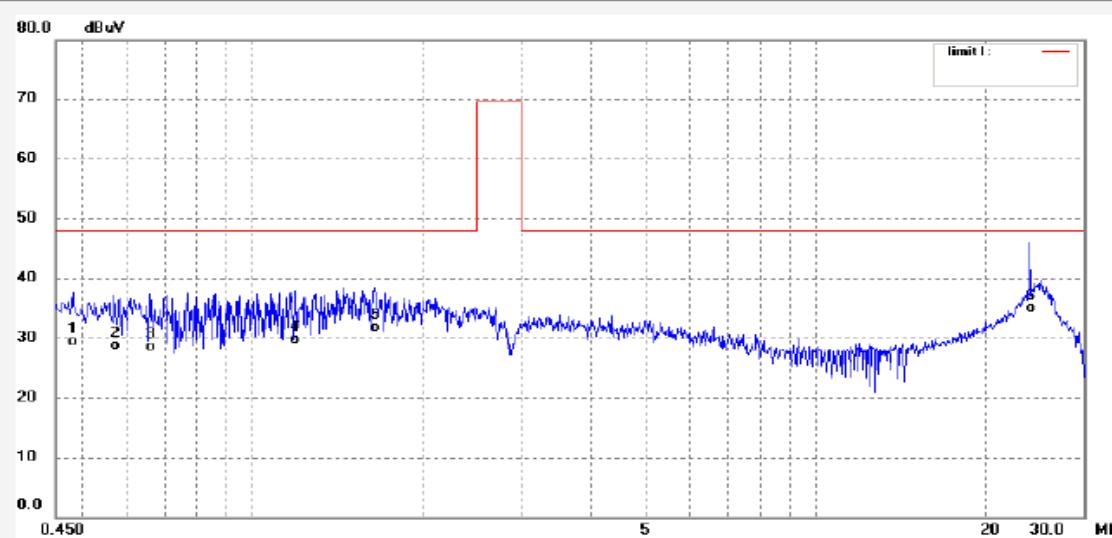


Neutral line:



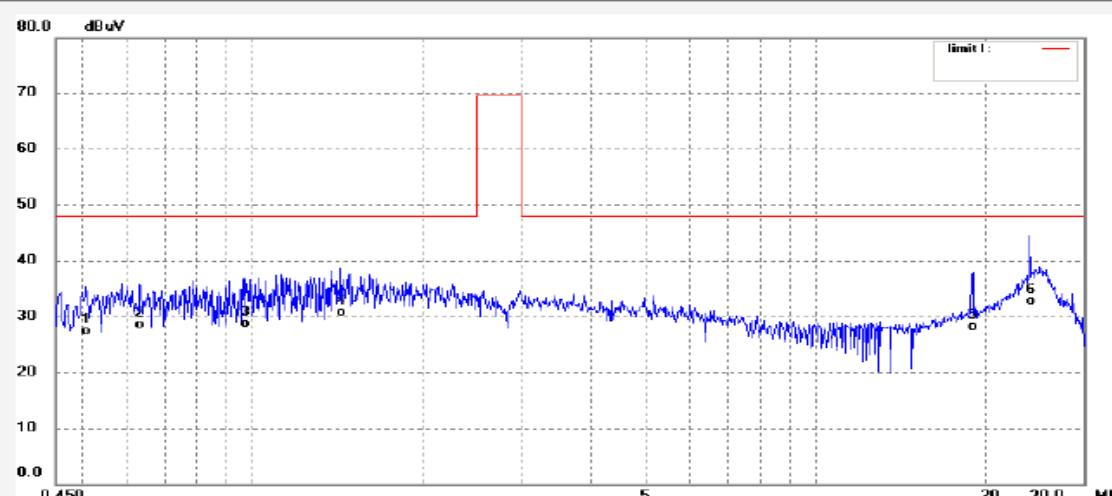
High mode:

Live line:



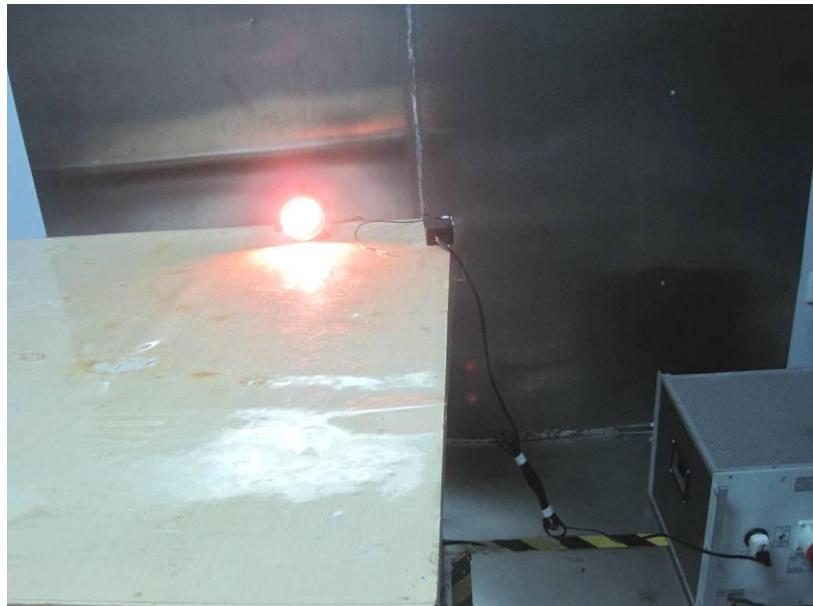
No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.4820	18.12	10.39	28.51	48.00	-19.49	QP	
2	0.5740	17.59	10.41	28.00	48.00	-20.00	QP	
3	0.6620	17.27	10.43	27.70	48.00	-20.30	QP	
4	1.1940	18.33	10.50	28.83	48.00	-19.17	QP	
5	1.6580	20.30	10.61	30.91	48.00	-17.09	QP	
6	24.1140	22.82	11.21	34.03	48.00	-13.97	QP	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.5100	16.16	10.40	26.56	48.00	-21.44	QP	
2	0.6340	17.23	10.42	27.65	48.00	-20.35	QP	
3	0.9740	17.41	10.45	27.86	48.00	-20.14	QP	
4	1.4460	19.34	10.56	29.90	48.00	-18.10	QP	
5	19.1380	16.07	11.14	27.21	48.00	-20.79	QP	
6	24.1140	20.78	11.21	31.99	48.00	-16.01	QP	

5.1.9 Photograph –Conducted Emission Test Setup



5.2 Radiation Emission Data

Test Requirement:	FCC Part18.305 :2010-10-1
Test Method:	ANSI C63.4:2003
Test Result:	PASS
Frequency Range:	30MHz to 1GHz
Measurement Distance:	3m
Class:	Class B
Limit:	40.0 dB μ V/m between 30MHz & 88MHz 43.5 dB μ V/m between 88MHz & 216MHz 46.0 dB μ V/m between 216MHz & 1000MHz
Detector:	Peak for pre-scan (120kHz resolution bandwidth) Quasi-Peak if maximised peak within 6dB of limit
EUT Operation :	Compliance test was performed in ON mode.

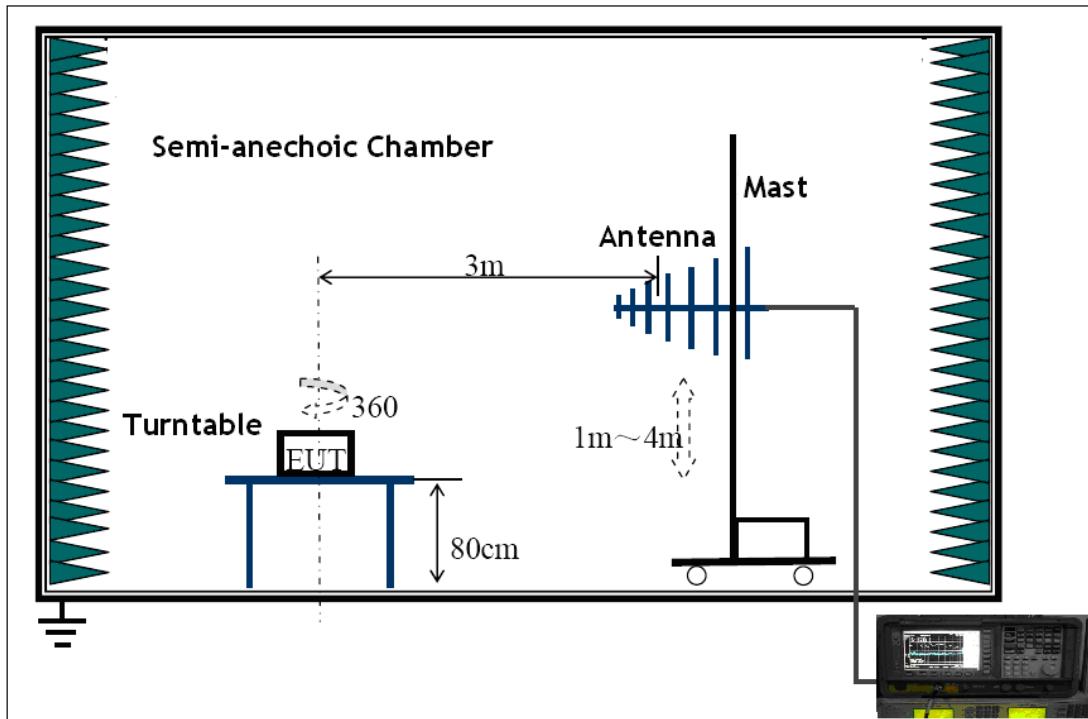
5.2.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on ANSI C63.4:2003, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Waltek Lab is ± 5.03 dB.

5.2.2 EUT Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI C63.4:2003, The specification used in this report was the FCC Part18.305 (C) Consumer equipment limits.



The EUT was placed on the test table in shielding room.

5.2.3 Spectrum Analyzer Setup

According to FCC Part18.305 Rules, the system was tested from 30 to 1000MHz.

Start Frequency.....	30 MHz
Stop Frequency.....	1000MHz
Sweep Speed Auto	
IF Bandwidth.....	120 KHz
Video Bandwidth.....	100KHz
Quasi-Peak Adapter Bandwidth	120 KHz
Quasi-Peak Adapter Mode.....	Normal
Resolution Bandwidth	100KHz

5.2.4 Test Procedure

For the radiated emissions test, maximizing procedure was performed on the six (6) highest emissions to ensure EUT is compliant with all installation combinations.

All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB μ V of specification limits), and are distinguished with a "Qp" in the data table.

The EUT was under normal mode during the final qualification test and the configuration was used to represent the worst case results.

5.2.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB μ V means the emission is 7dB μ V below the maximum limit for Class B. The equation for margin calculation is as follows:

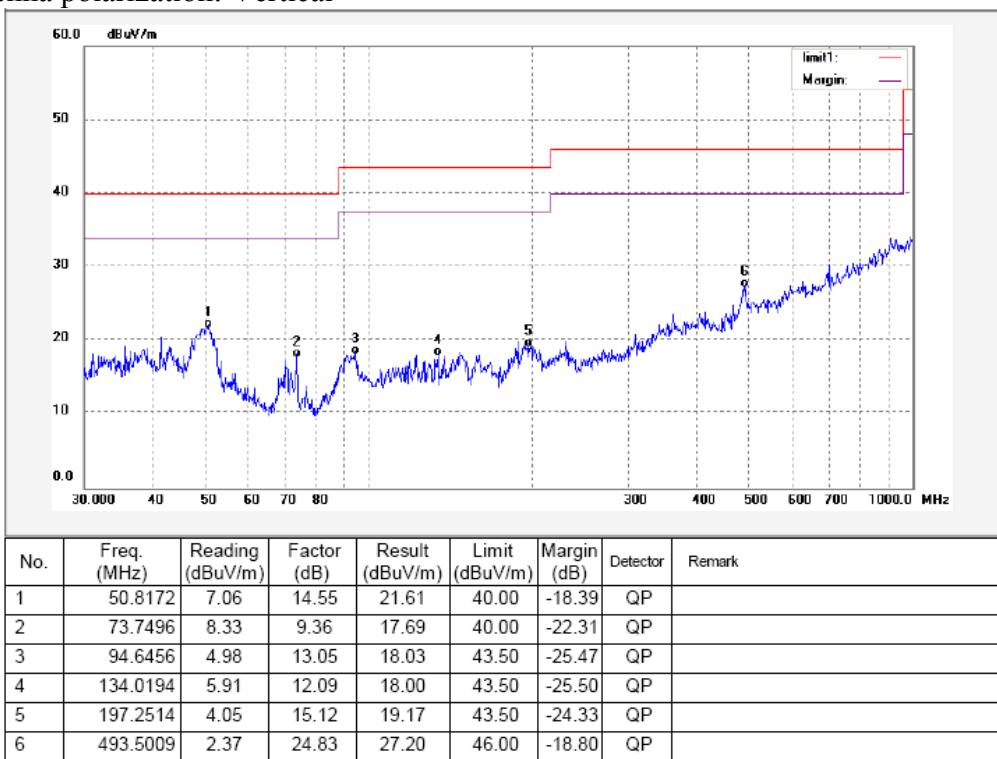
$$\text{Margin} = \text{Corr. Ampl.} - \text{Class B Limit}$$

5.2.6 Summary of Test Results

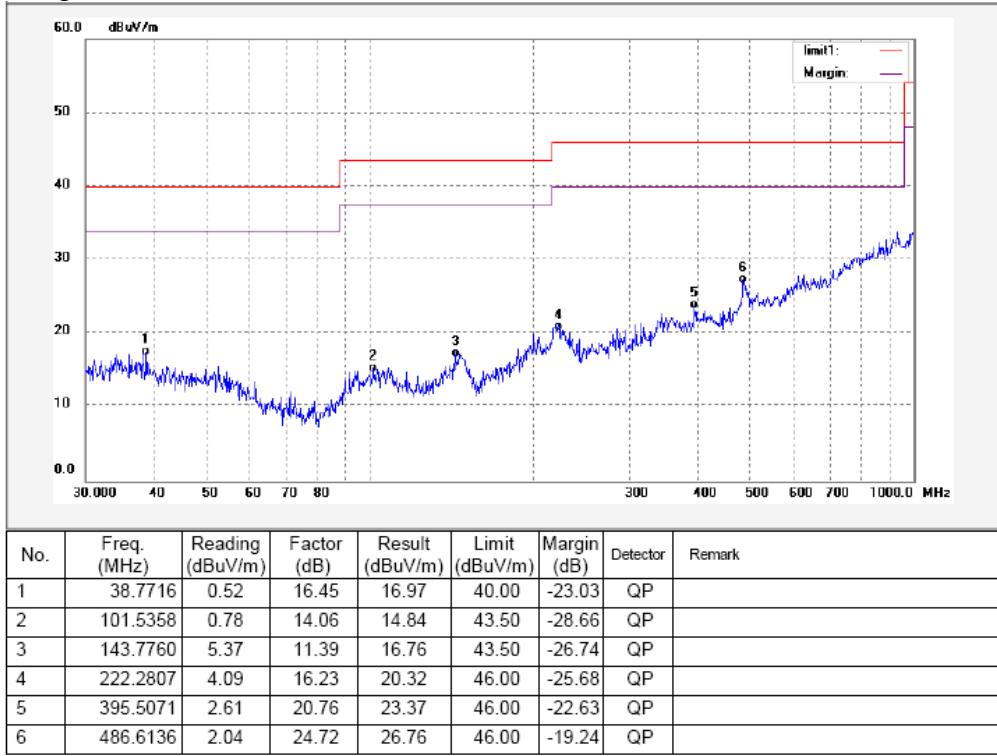
According to the data in this section, the EUT complied with the FCC Part18:2010-10-1 standards.

Low mode:

Antenna polarization: Vertical

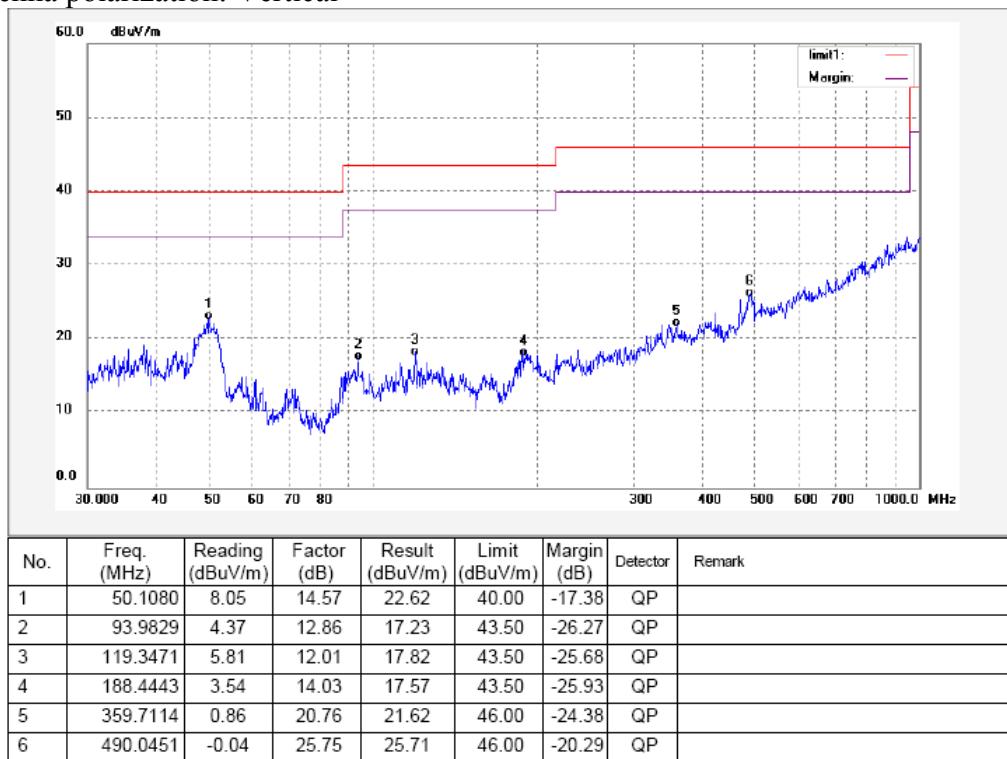


Antenna polarization: Horizontal

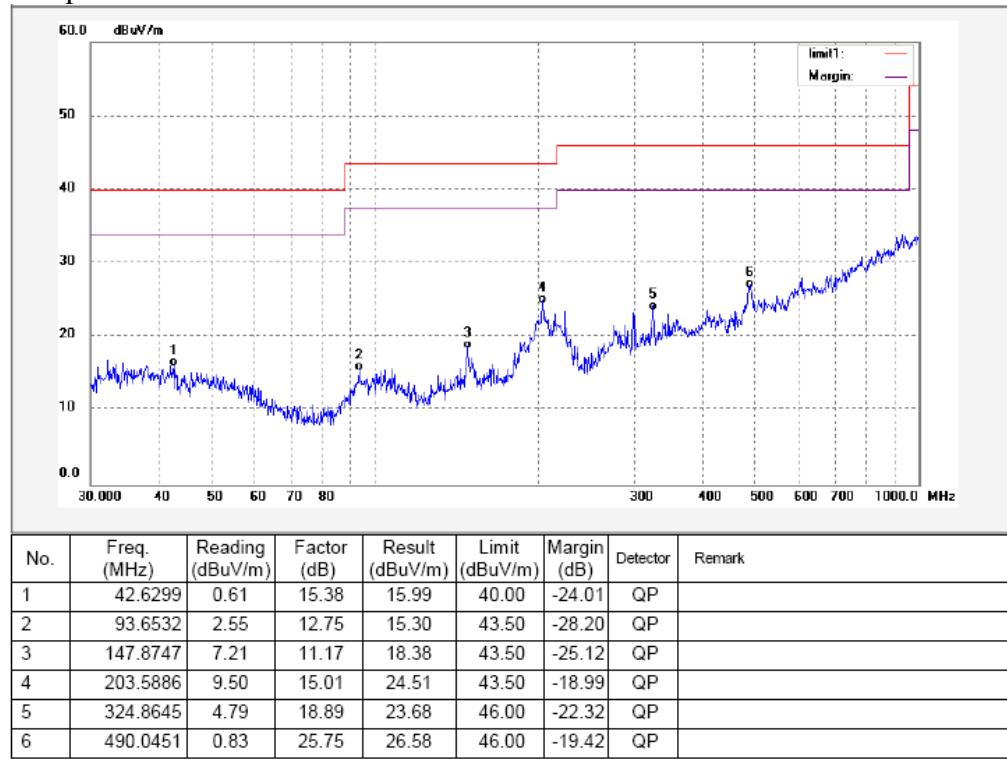


Middle mode:

Antenna polarization: Vertical

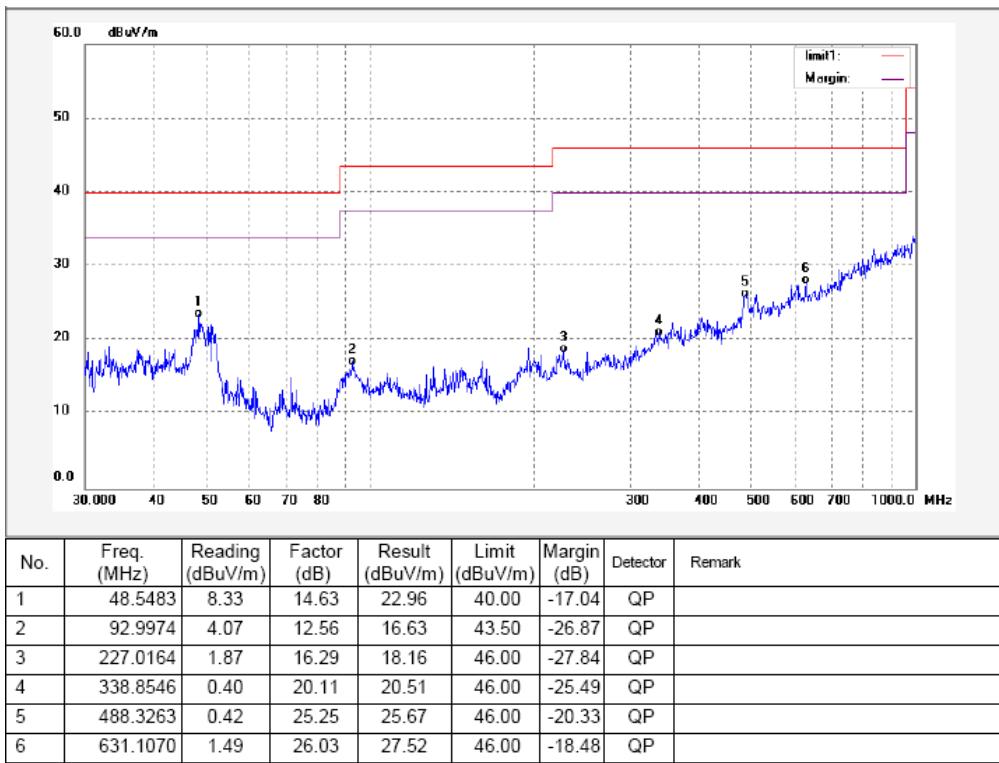


Antenna polarization: Horizontal

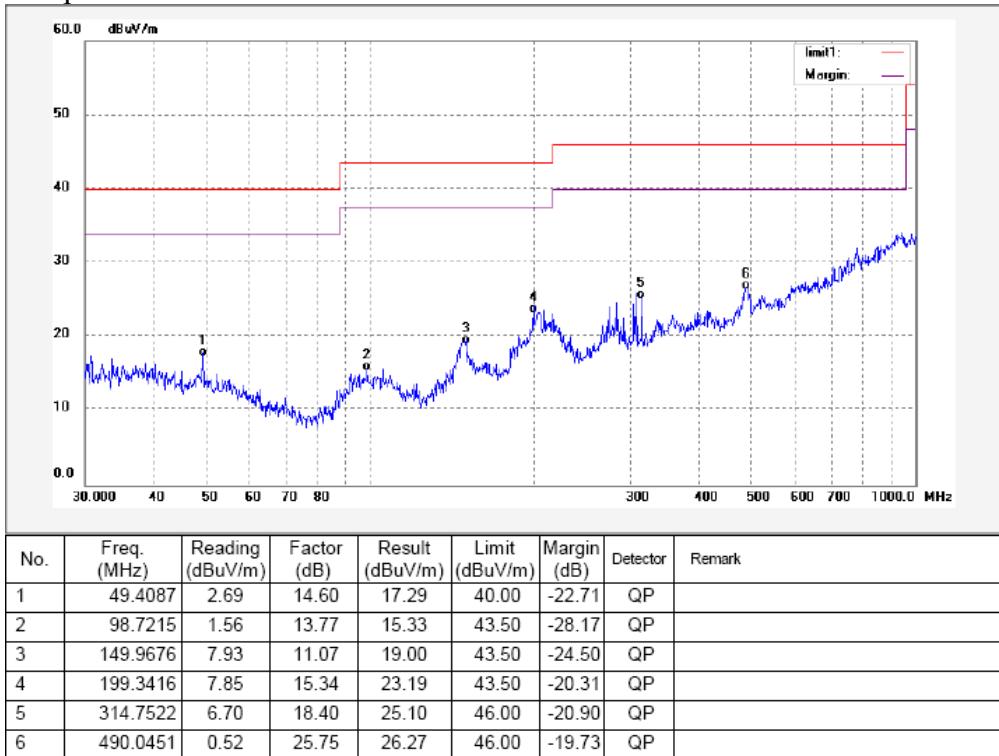


High mode:

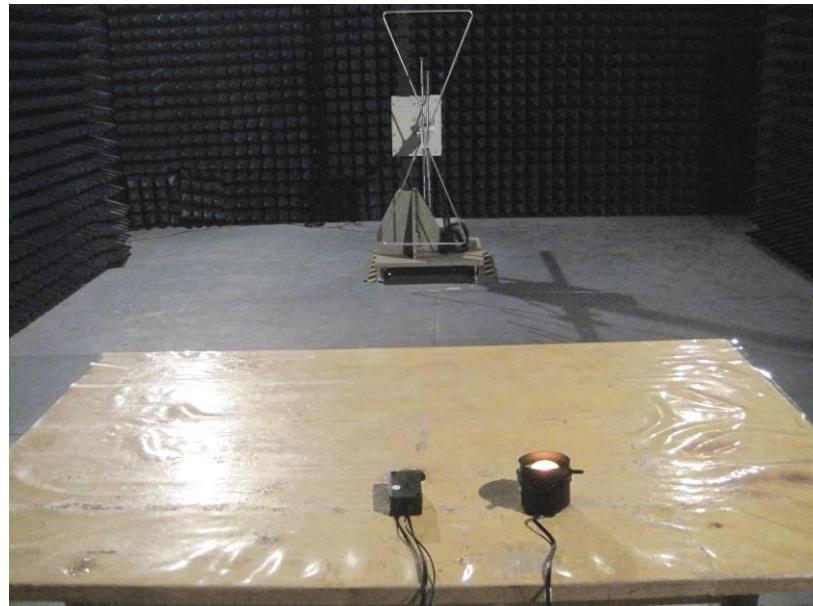
Antenna polarization: Vertical



Antenna polarization: Horizontal



5.2.7 Photograph – Radiation Emission Test Setup



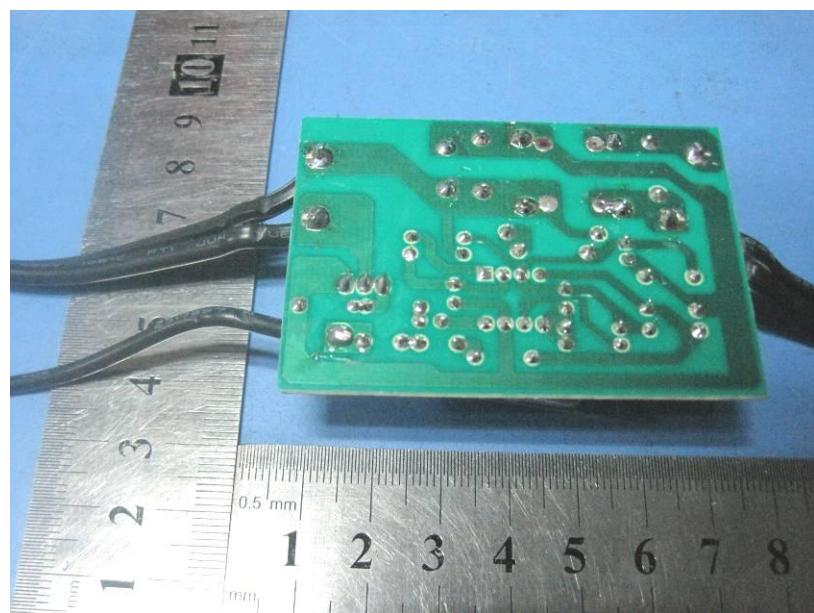
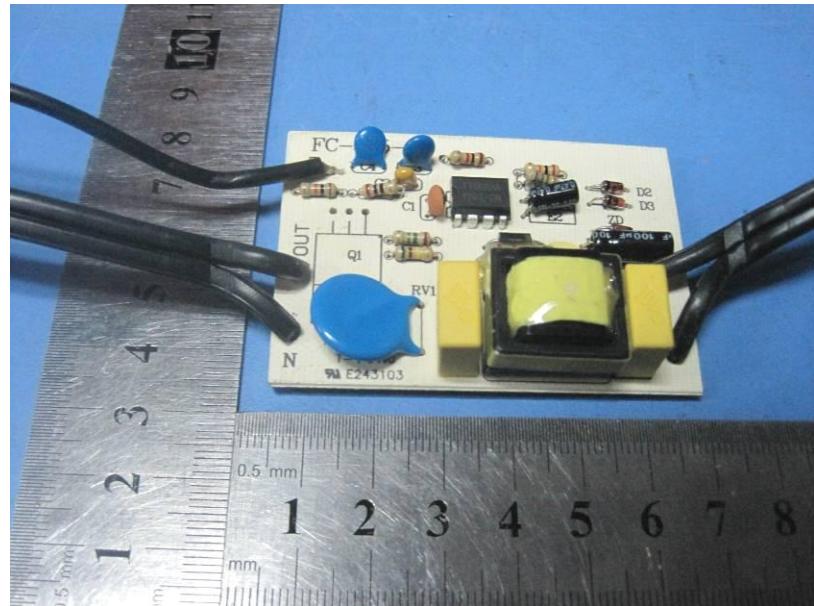
6 Photographs - Constructional Details

6.1 EUT – External View



6.2 EUT – Internal View





7 FCC Label

This device complies with Part 18 of the FCC Rules. Operation is subject to the following two conditions:(1)this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation

The Label must not be a stick-on paper. The Label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

