

FCC TEST REPORT

FCC ID : XESGN416T

Applicant : DONGGUAN HUGESUN LIGHTING CO.,LTD

Address : New street NO.15, Da Cao Fang Zone, Zhushan Town, Dongguan City, Guang
Dong Province, China

Equipment Under Test (EUT) :

Product description : Fluorescent Lamp

Model No. : GN416T, TF416

Standards : FCC Part18

Date of Test : May. 19, 2009

Test Engineer : **Zero.Zhou**

Reviewed By : *Philo Zhou*

Test Result :	PASS *
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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

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2 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission (30MHz to 1GHz)	FCC PART 18: 2007	ANSI C63.4:2003	Clause 18.305	PASS
Conducted Emission (450KHz to 30MHz)	FCC PART 18: 2007	ANSI C63.4:2003	Clause 18.307	PASS

3 General Information

3.1 Client Information

Applicant: DONGGUAN HUGESUN LIGHTING CO.,LTD
Address of Applicant: New street NO.15, Da Cao Fang Zone, Zhushan Town, Dongguan City, Guang Dong Province, China

3.2 General Description of E.U.T.

Product description: Fluorescent Lamp
Model No.: GN416T, TF416
Model Description: The model difference is model name, GN416T is test sample.

3.3 Details of E.U.T.

Power Supply: 120VAC / 60Hz

3.4 Description of Support Units

The EUT has been tested as an independent unit.

3.5 Standards Applicable for Testing

The customer requested FCC tests for a Fluorescent Lamp. The standards used were FCC Part18.

3.6 Test Methodology

All measurements contained in this report are conducted with FCC Measurement Procedure MP-5, technical requirements for Methods of Measurement of Radio-Noise Emission from ISM Equipment.

3.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **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, June 24, 2008.

- **IC – Registration No.: IC7760**

Waltek Services(Shenzhen) Co., Ltd. EMC Laboratory 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 IC7760, July 24, 2008.

3.8 Test Location

All Emission 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

Equipment Name	Manufacturer Model	Equipment No	Internal No	Specification	Cal. Date	Due Date	Cert. No	Uncertainty
EMC Analyzer	Agilent/ E7405A	MY45114 943	W2008001	9k-26.5GHz	Aug-08	Aug-09	Wws200 81596	±1dB
Trilog Broadband Antenne 30-3000 MHz	SCHWARZ BECK MESS- ELEKTROM / VULB9163	336	W2008002	30-3000 MHz	Aug-08	Aug-09		±1dB
Broad- band Horn Antenna 1- 18 GHz	SCHWARZ BECK MESS- ELEKTROM / VULB9163	667	W2008003	1-18GHz	Aug-08	Aug-09		f<10 GHz: ±1dB 10GHz<f< 18 GHz: ±1.5dB
Broadband Preamplifi er 0.5-18 GHz	SCHWARZ BECK MESS- ELEKTROM / BBV 9718	9718-148	W2008004	0.5-18GHz	Aug-08	Aug-09		±1.2dB
10m Coaxial Cable with N-male Connector s usable up to 18GHz,	SCHWARZ BECK MESS- ELEKTROM / AK 9515 H	-	-	-	Aug-08	Aug-09		-
10m 50 Ohm Coaxial Cable with N- plug, indivi dual length, usa ble up to 3(5)GHz, Connector	SCHWARZ BECK MESS- ELEKTROM / AK 9513				Aug-08	Aug-09		
Positionin g Controller	C&C LAB/ CC-C-IF				N/A	N/A		
Color Monitor	SUNSP0/ SP-14C				N/A	N/A		
Test Receiver	ROHDE&SC HWARZ/ ESPI	101155	W2005001	9k-3GHz	Jul-08	Jul-09	Wws200 80942	±1dB
EMI Receiver	Beijingkehua n	KH3931		9k-1GHz	Aug-08	Aug-09		

Equipment Name	Manufacturer Model	Equipment No	Internal No	Specification	Cal. Date	Due Date	Cert. No	Uncertainty
Two-Line V- Network	ROHDE&SC HWARZ/ ENV216	100115	W2005002	50Ω/50μH	Jul-08	Jul-09	Wws200 80941	±10%
V—LISN	SCHWARZ BECK MESS — ELEKTRON IK	NSLK 8128	8128-259	9k-30MHz	Jul-08	Jul-09		
Absorbing Clamp	ROHDE&SC HWARZ/ MDS-21	100205	W2005003	impandance50 Ω loss : 17 dB	Jul-08	Jul-09	Wws200 80943	±1dB
10m 50 Ohm Coaxial Cable with N-plug, individual length, usable up to 3(5)GHz, Connectors	SCHWARZ BECK MESS- ELEKTROM / AK 9514				Aug-08	Aug-09		

5 Conducted Emission Test

Test Requirement:	FCC Part 18
Test Method:	Based on ANSI C63.4:2003
Test Result:	PASS
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 Test Equipment

Please refer to Section 4 this report.

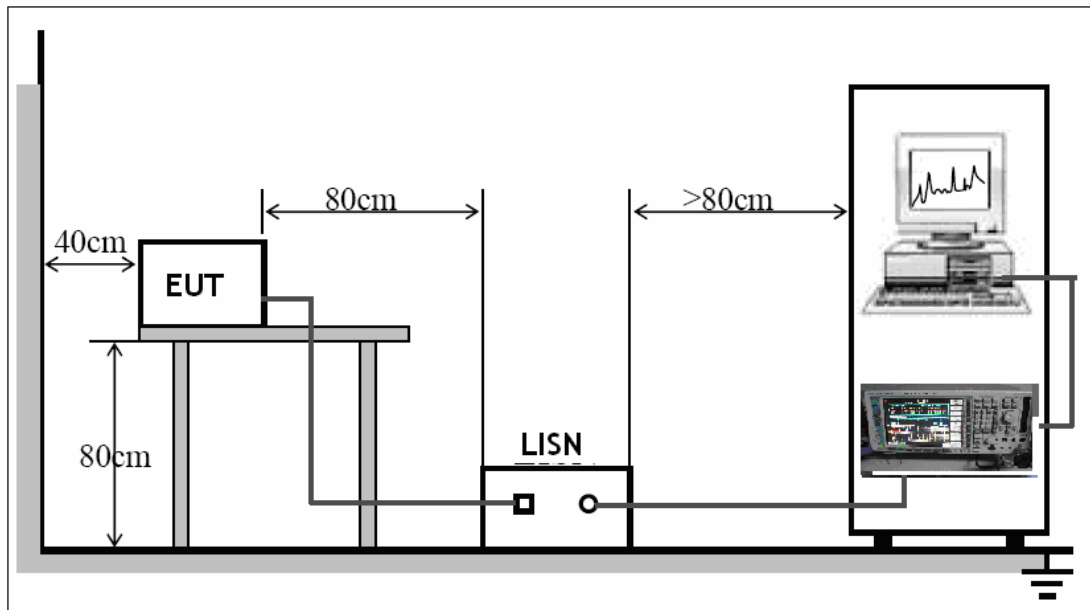
5.2 Test Procedure

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.

5.3 Conducted Test Setup

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

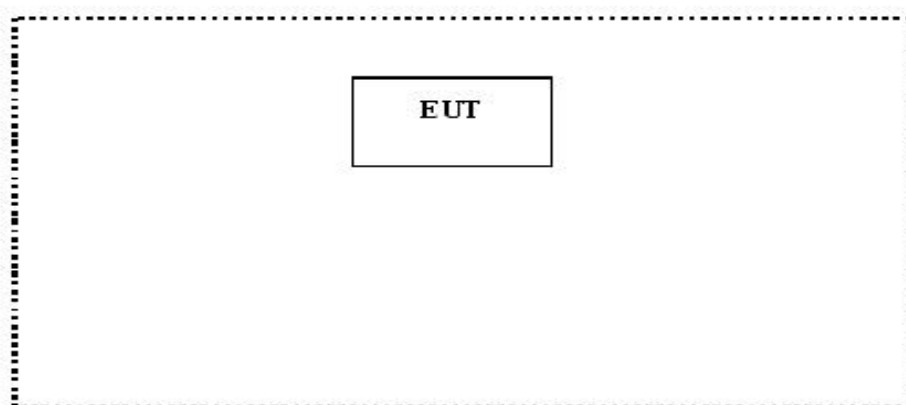
The EUT was tested in ON mode.



5.4 EUT Operating Condition

Operating condition is according to FCC MP-5.

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



5.5 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.

5.6 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

5.7 Conducted Emission Test Result

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

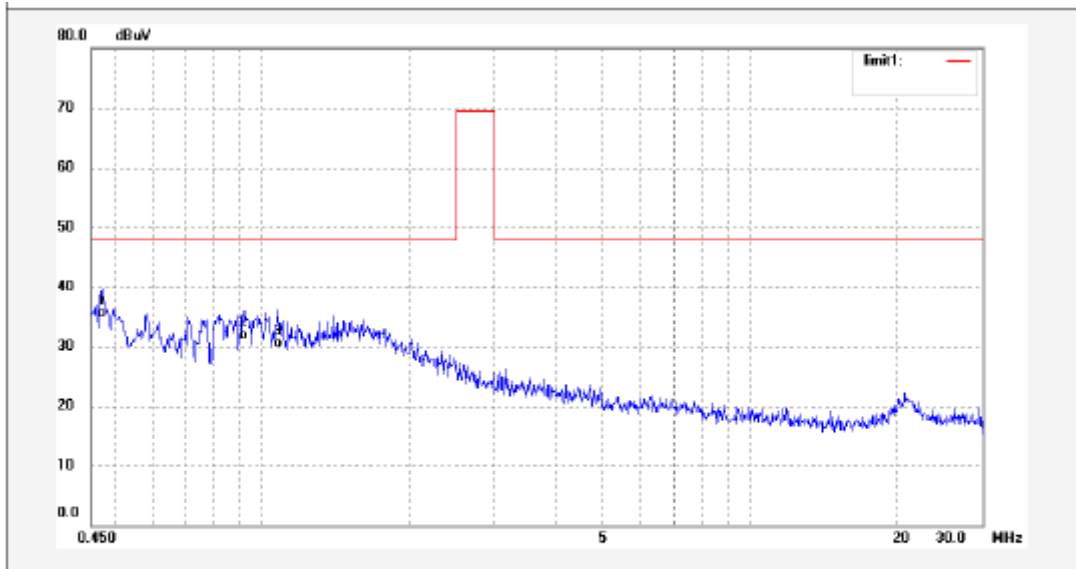
5.7.1 Measurement Data

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.

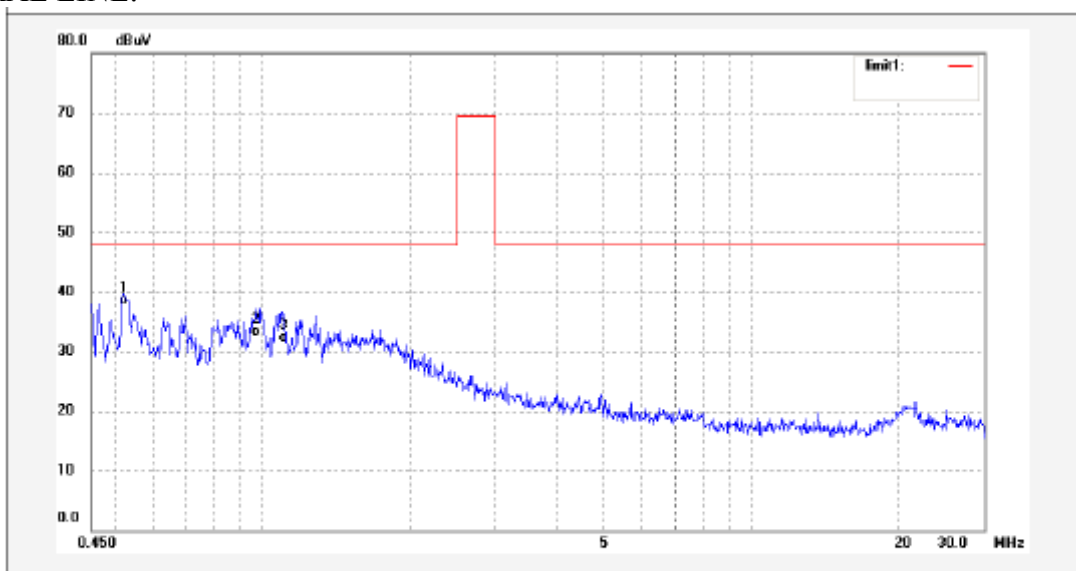
Please refer to the following peak scan graph for reference.

LIVE LINE:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.4740	23.92	10.80	34.72	48.00	-13.28	QP	
2	0.9220	20.74	10.38	31.12	48.00	-16.88	QP	
3	1.0859	18.53	11.19	29.72	48.00	-18.28	QP	

NEUTRAL LINE:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.5220	27.02	10.68	37.70	48.00	-10.30	QP	
2	0.9780	21.61	10.96	32.57	48.00	-15.43	QP	
3	1.1100	20.38	11.19	31.55	48.00	-16.45	QP	

6 Radiated Emissions Test

6.1 Radiated Emission Data

Test Requirement:	FCC Part18.305
Test Method:	ANSI C63.4:2003
Test Result:	PASS
Frequency Range:	30MHz to 1GHz
Measurement Distance:	3m
Class:	Class B
Limit:	40 dB μ V/m between 30MHz & 88MHz 43.5 dB μ V/m between 88MHz & 216MHz 46 dB μ V/m between 216MHz & 1000MHz
Detector:	Peak for pre-scan (120kHz resolution bandwidth) Quasi-Peak if maximised peak within 6dB of limit

6.1.1 Measurement Uncertainty

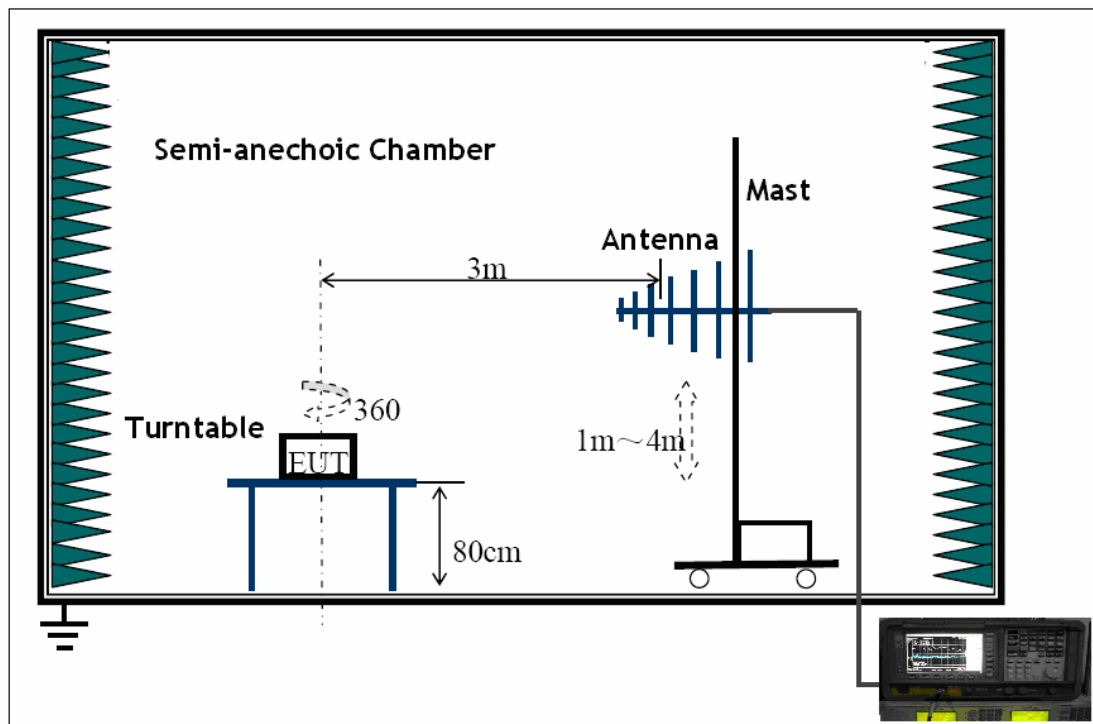
All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor 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.

6.1.2 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 tested in ON mode.



6.1.3 Spectrum Analyzer Setup

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

Start Frequency	30 MHz
Stop Frequency	1 GHz
Sweep Speed	Auto
IF Bandwidth	120 KHz
Video Bandwidth	100KHz
Quasi-Peak Adapter Bandwidth	120 KHz
Quasi-Peak Adapter Mode.....	Normal
Resolution Bandwidth	100KHz

6.1.4 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 $-4 \text{ dB}\mu\text{V}$ of specification limits), and are

distinguished with a "Qp" in the data table. But any frequency above 1000 MHz, the limit is based on average detector.

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

6.1.5 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:

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

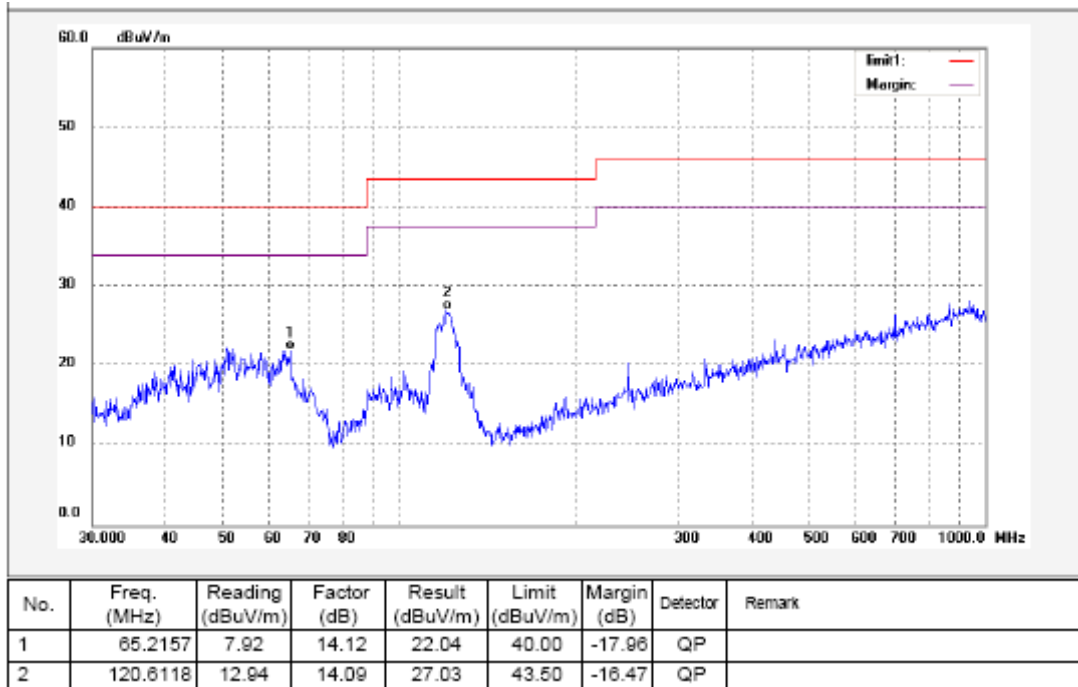
The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB μ V means the emission is 7dB μ V below the maximum limit for Class B. The equation for margin calculation is as follows:

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

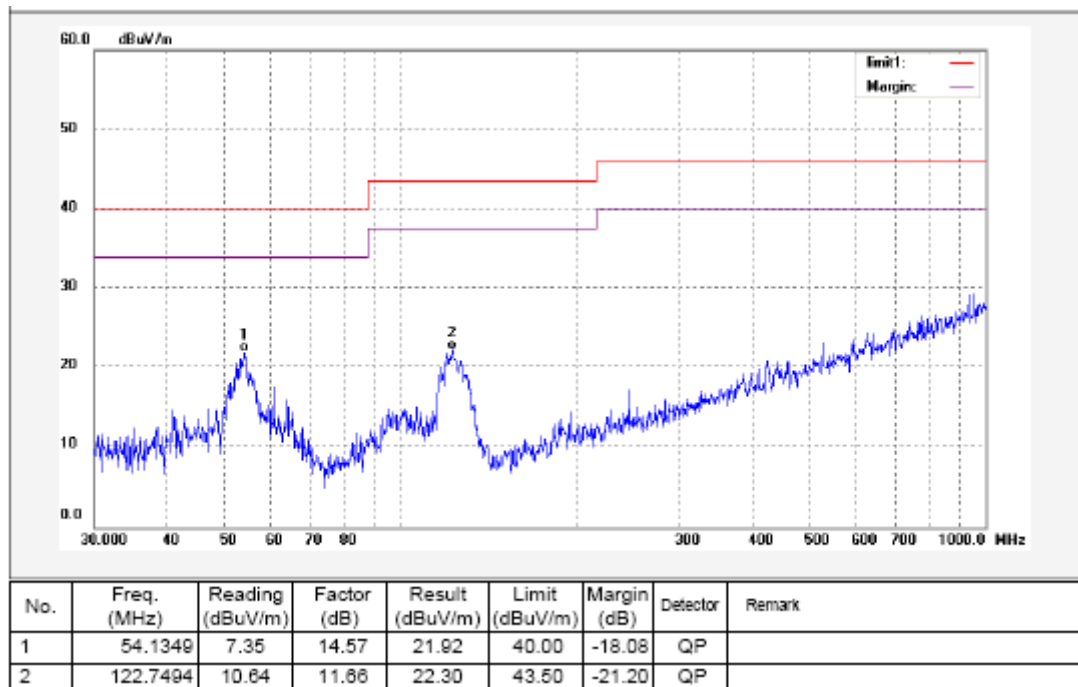
6.1.6 Summary of Test Results

According to the data in this section , the EUT complied with the FCC Part18. standards.

Horizontal:

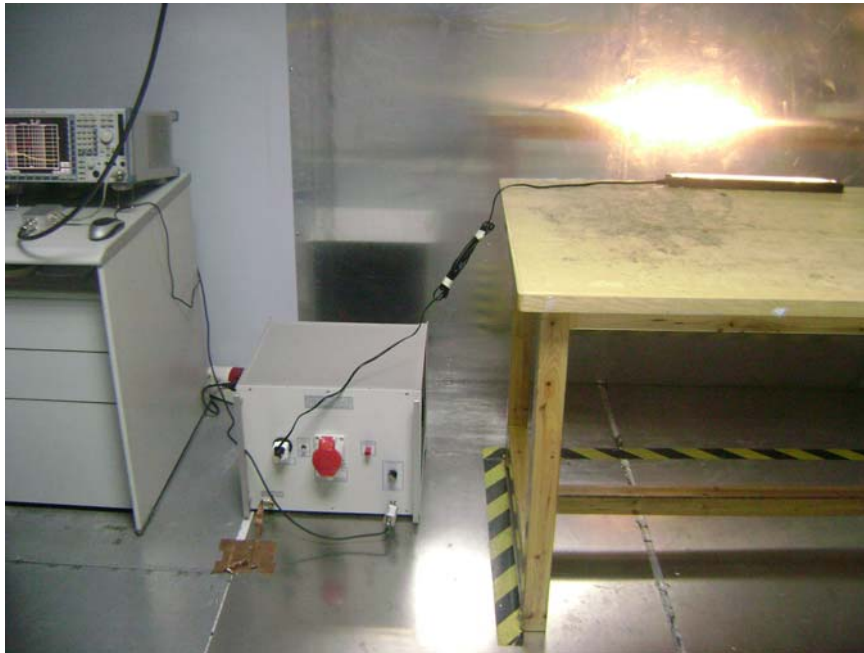


Vertical:

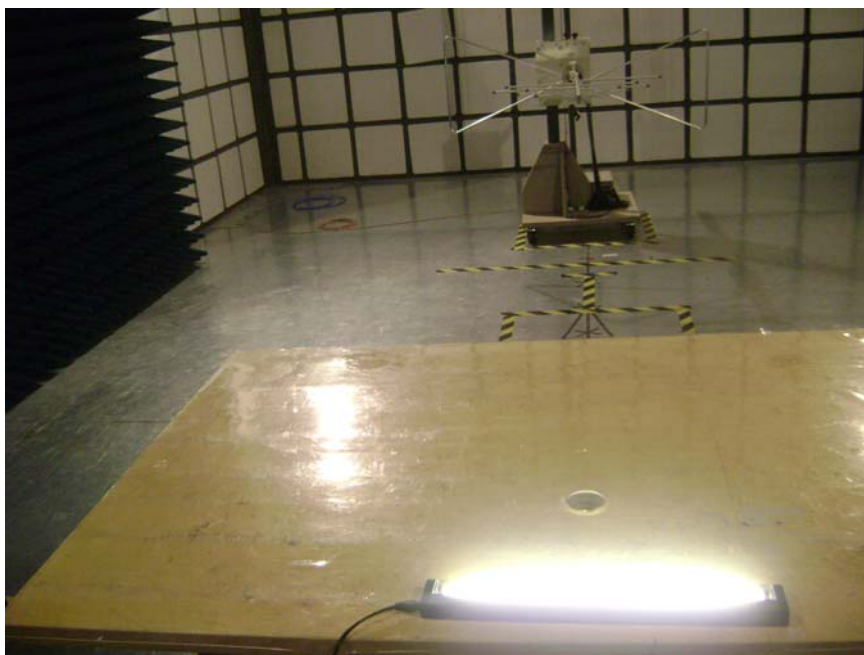


7 Photographs of Testing

7.1 Conducted Emission Test View



7.2 Radiated Emission Test View



8 Photographs - Constructional Details

8.1 EUT - Front View



8.2 EUT - Back View



8.3 PCB - Front View



8.4 PCB - Back View



9 FCC ID Label

This device complies with FCC Part 18 of the FCC Rules.

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.

Proposed Label Location on EUT
EUT Top View/ proposed FCC Label Location

