FCC TEST REPORT

FCC ID : WZEQS-BL101B

Applicant : Quasar Optoelectronics, Inc.

Address : Shagang Industrial Areas, Xinhui Sanjiang Town Jiangmen, Guangdong

Equipment Under Test (EUT) :

Product description : LED Energy Saving Lamp

Model No. : QS-PAR30A, QS-PAR30B, QS-BL101A, QS-BL101B

Standards : FCC Part18

Date of Test : Mar. 7, 2009

Test Engineer : Maikou.zhang

Reviewed By : Phillo zhong

PREPARED BY:
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Tel: 86-755-27553488
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Contents

2 Test Summary

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

3 General Information

3.1 Client Information

Applicant:	Quasar Optoelectronics, Inc.
Address of Applicant:	Shagang Industrial Areas, Xinhui Sanjiang Town Jiangmen, Guangdong

3.2 General Description of E.U.T.

Product description:	LED Energy Saving Lamp
Model No.:	QS-PAR30A, QS-PAR30B, QS-BL101A, QS-BL101B
Note:	The PCB of all the models are same except that the appearance and output power difference(the model of QS-PAR30A, QS-PAR30B, QS-BL101B output power are the same 11W ,and the model of QS-PAR30A, QS-PAR30B appearance are the same,the QS-BL101A output power is 6W), the model QS-BL101A and QS-BL101B were testing samples , so the final test data show was the testing samples only in the report .

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 LED Energy Saving 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 Emissions testswere performed at:-
1/F, Fukangtai Building,West Baima Rd.,Songgang Street,
Baoan District, Shenzhen 518105, Guangdong,China.

4 Equipment Used during Test

NO	Equipment Name	Manufacturer Model	Equipment No	Internal No	Specification	Cal. Date	Due Date	Cert. No	Uncertainty
1.	EMC Analyzer	Agilent/ E7405A	MY45114943	W2008001	9k-26.5GHz	Aug-08	Aug-09	Wws200815 96	±1dB
2.	Trilog Broadband Antenne 30-3000 MHz	SCHWARZBECK MESS-ELEKTROM/ VULB9163	336	W2008002	30-3000 MHz	Jul-08	Jul-09		±1dB
3.	Broad-band Horn Antenna 1-18 GHz	SCHWARZBECK MESS-ELEKTROM/ VULB9163	667	W2008003	1-18GHz	Jul-08	Jul-09		f ＜ 10 GHz：±1dB 10GHz ＜f＜18 GHz ：±1.5dB
4.	Broadband Preamplifier 0.5-18 GHz	SCHWARZBECK MESS-ELEKTROM/ BBV 9718	9718-148	W2008004	0.5-18GHz	Jul-08	Jul-09		±1.2dB
5.	10m Coaxial Cable with N-male Connectors usable up to 18GHz,	SCHWARZBECK MESS-ELEKTROM/ AK 9515 H	-	-	-	Jul-08	Jul-09		-
6.	10m 50 Ohm Coaxial Cable with N-plug,individual length,usable up to 3(5)GHz, Connector	SCHWARZBECK MESS-ELEKTROM/ AK 9513				Jul-08	Jul-09		
7.	Positioning Controller	C&C LAB/ CC-C-IF							
8.	Color Monitor	SUNSPO/ SP-14C							

NO	Equipment Name	Manufacturer Model	Equipment No	Internal No	Specification	Cal. Date	Due Date	Cert. No	Uncertainty
9.	Test Receiver	ROHDE&SCHWARZ/ ESPI	101155	W2005001	9k-3GHz	Jul-08	Jul-09	Wws200809 42	±1dB
10.	EMI Receiver	Beijingkehuan	KH3931		9k-1GHz	Aug-08			
11.	Two-Line V-Network	ROHDE&SCHWARZ/ ENV216	100115	W2005002	50Ω/50μH	Jul-08	Jul-09	Wws200809 41	±10%
12.	V－LISN	SCHWARZBECK MESS－ELEKTRONIK	NSLK 8128	8128-259	9k-30MHz	Jul-08	Jul-09		
13.	Absorbing Clamp	ROHDE&SCHWARZ/ MDS-21	100205	W2005003	impandance50Ω loss：17dB	Jul-08	Jul-09	Wws200809 43	±1dB
14.	10m 50 Ohm Coaxial Cable with N-plug,individual length,usable up to 3(5)GHz, Connectors	SCHWARZBECK MESS-ELEKTROM/ AK 9514				Jul-08	Jul-09		

5 Conducted Emission Test

Product Name:	LED Energy Saving Lamp
Test Requirement:	FCC Part 18
Test Method:	Based on ANSI C63.4:2003
Test Date:	Mar. 7, 2009
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 5 this report.

5.2 Test Procedure

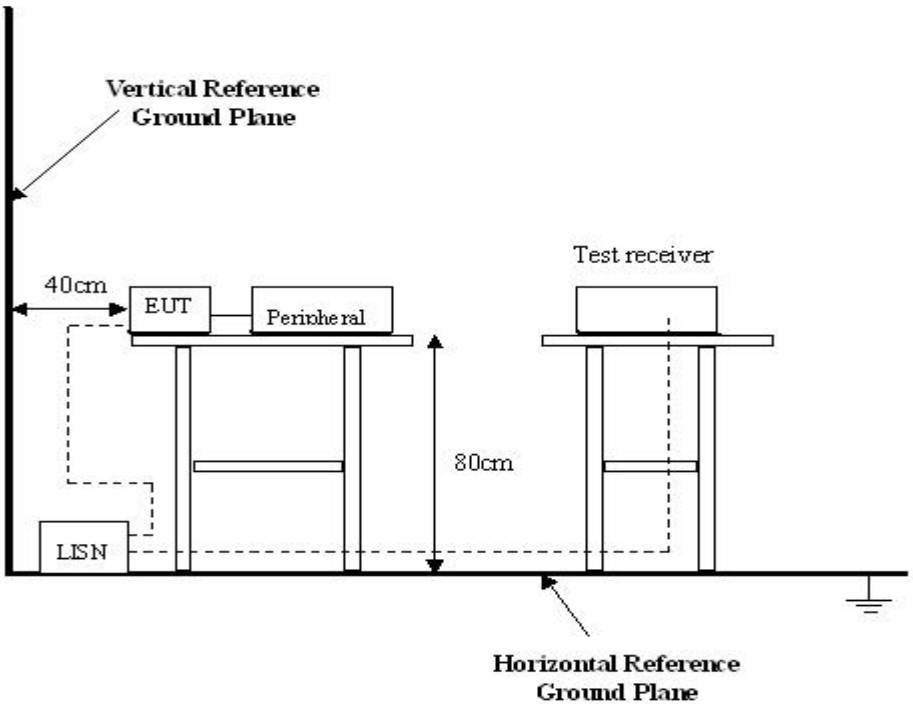
1. During the conducted emission test, the power cord of the EUT is connected to the auxiliary outlet of the LISN.
2. The EUT was tested according to FCC MP-5. The frequency spectrum from 450kHz to 30MHz was investigated.
3. The maximised peak emissions from the EUT was scanned and measured for both 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 is tested independently.

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



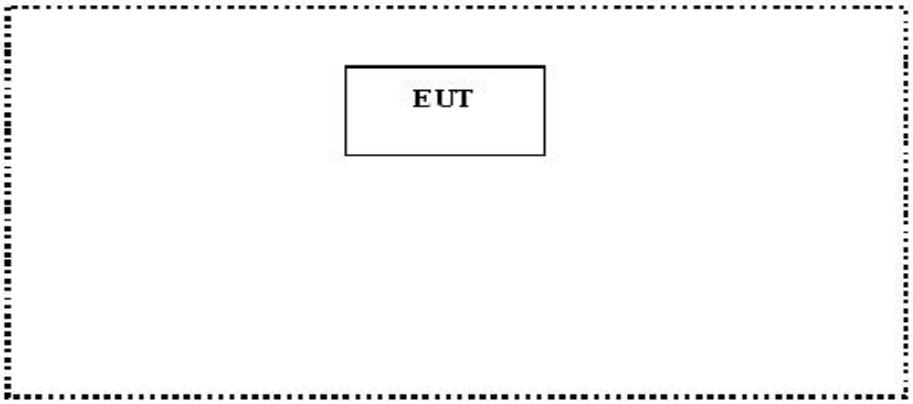
5.4 EUT Operating Condition

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

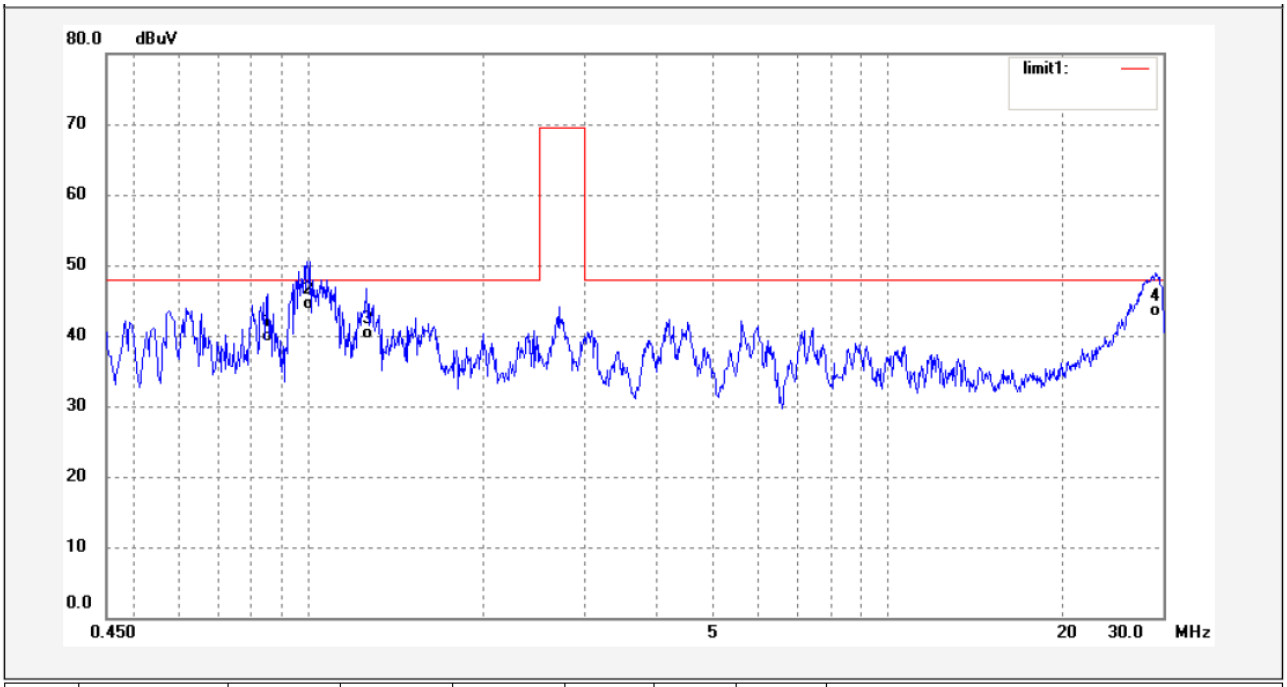
Test Item:	Conducted Emission Test
Test Voltage:	120VAC / 60Hz
Test Mode:	Normal
Temperature:	25.5 °C
Humidity:	51%RH
Test Result:	PASS

5.7.1 Measurement Data

An initial pre-scan was performed on the live and neutral lines.
No futher 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.

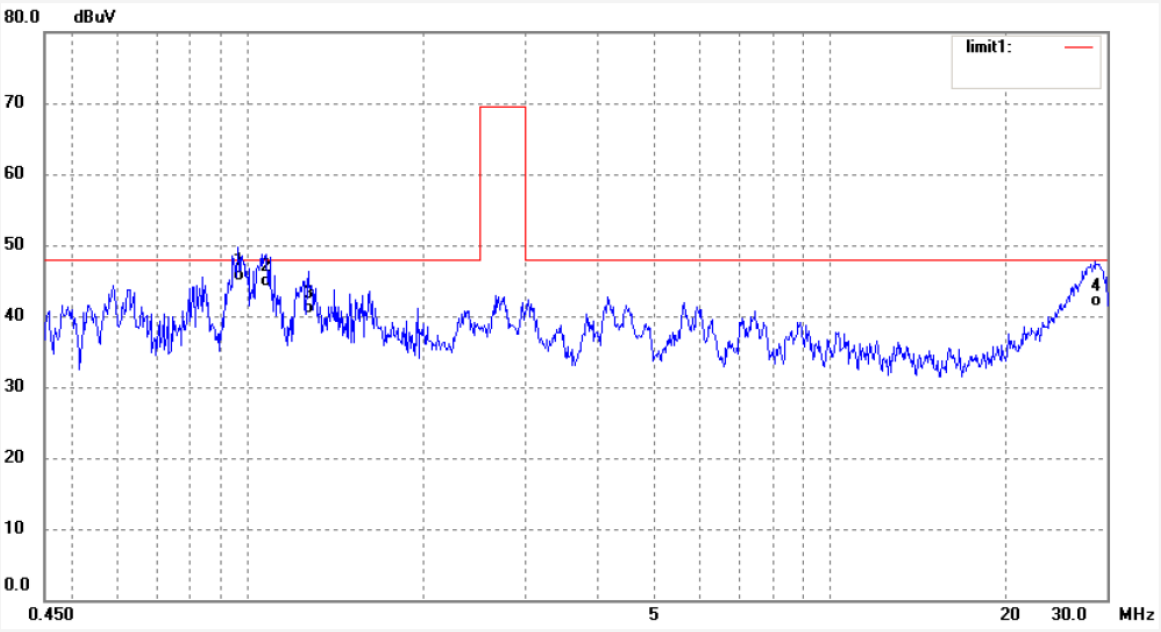
Model : QS-BL101B(11W)

LIVE LINE



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.8540	28.68	10.50	39.18	48.00	-8.82	QP	
2	1.0020	33.13	10.50	43.63	48.00	-4.37	QP	
3	1.2660	28.93	10.50	39.43	48.00	-8.57	QP	
4	29.1300	32.11	10.50	42.61	48.00	-5.39	QP	

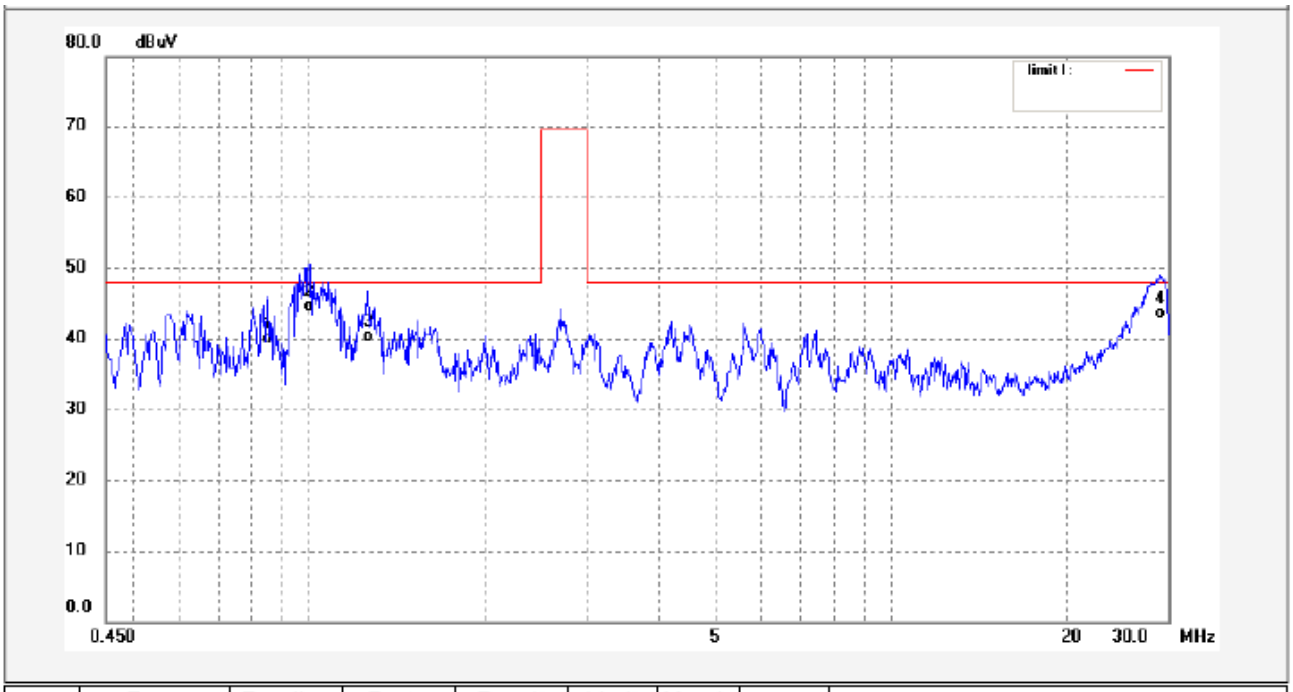
NEUTRAL LINE



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.9700	34.35	10.50	44.85	48.00	-3.15	QP	
2	1.0820	33.62	10.50	44.12	48.00	-3.88	QP	
3	1.2780	29.71	10.50	40.21	48.00	-7.79	QP	
4	28.7660	30.79	10.50	41.29	48.00	-6.71	QP	

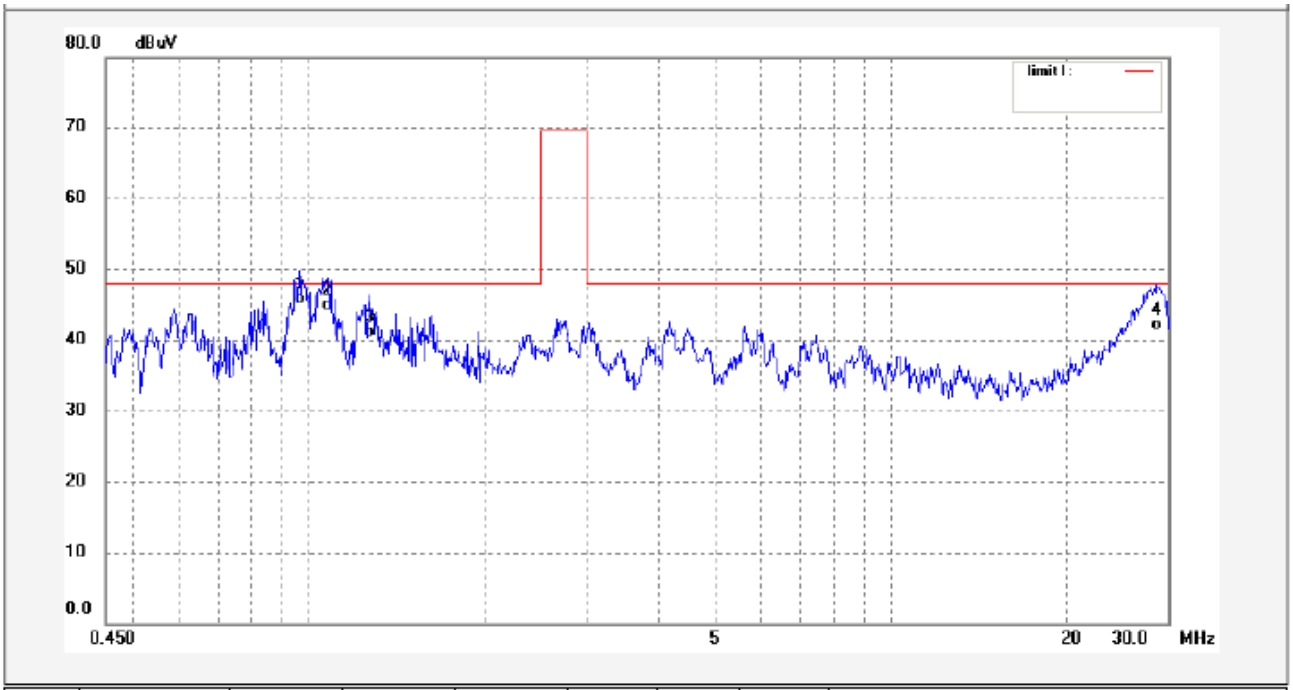
Model : QS-BL101A(6W)

LIVE LINE



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.8540	28.68	10.50	39.18	48.00	-8.82	QP	
2	1.0020	32.13	10.50	43.63	48.00	-5.37	QP	
3	1.2660	28.93	10.50	39.43	48.00	-8.57	QP	
4	29.1300	32.11	10.50	42.61	48.00	-5.39	QP	

NEUTRAL LINE



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.9700	33.35	10.50	44.85	48.00	-4.15	QP	
2	1.0820	33.12	10.50	44.12	48.00	-3.38	QP	
3	1.2780	29.71	10.50	40.21	48.00	-7.79	QP	
4	28.7660	30.79	10.50	41.29	48.00	-6.71	QP	

6 Emissions Test Results

6.1 Radiation Emission Data

Test Requirement:	FCC Part18 15.305
Test Method:	ANSI C63.4:2003
Test Date:	Mar. 7, 2009
Frequency Range:	30MHz to 1GHz
Measurement Distance:	3m
Class:	Class B
Limit:	40 dBμV/m between 30MHz & 88MHz
	43.5 dBμV/m between 88MHz & 216MHz
	46 dBμV/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 +5.05 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 epuipment limits.
The EUT was placed on the test table 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 dBμV 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:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

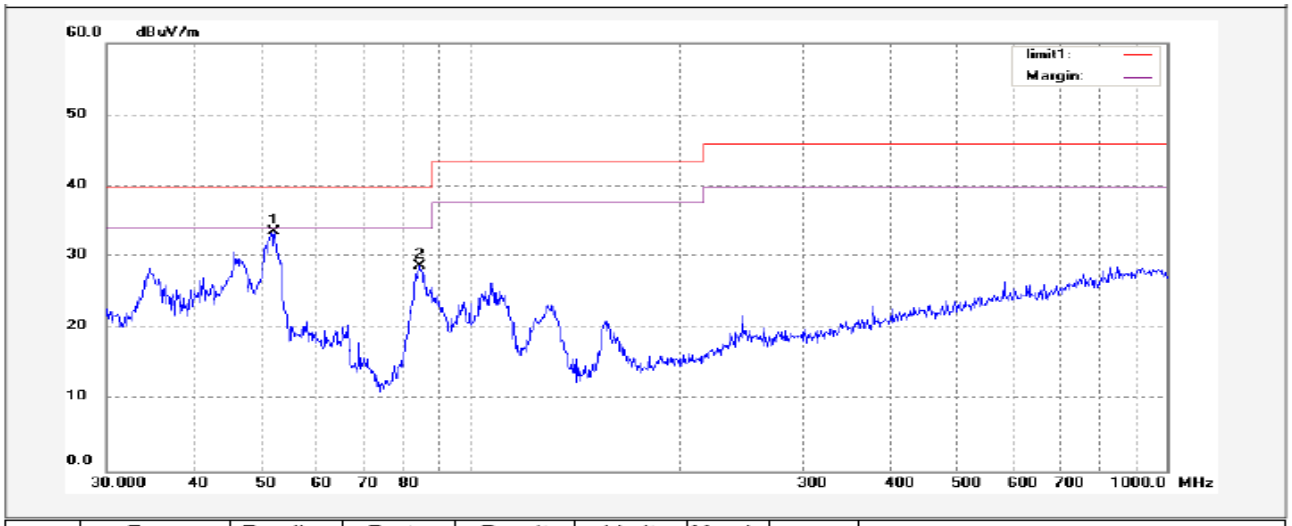
The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dBμV means the emission is 7dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:
Margin = Corr. Ampl. – Class B Limit

6.1.6 Summary of Test Results

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

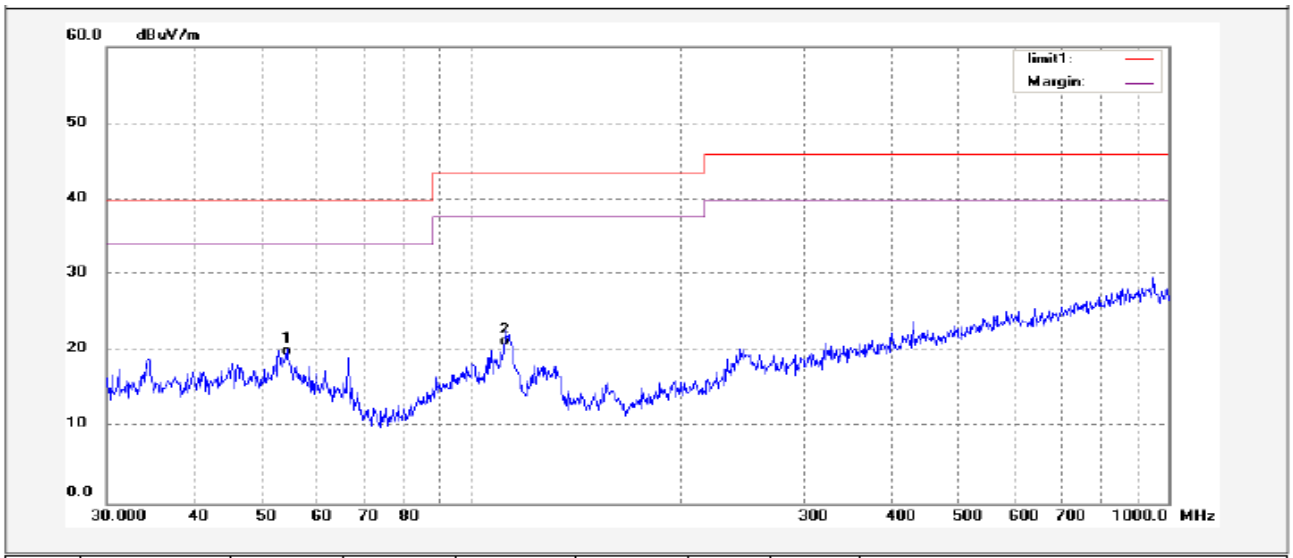
Model : Model : QS-BL101B(11W)

Horizontal:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	52.2659	16.80	16.65	33.45	40.00	-6.55	peak	
2	84.5806	14.99	13.75	28.74	40.00	-11.26	peak	

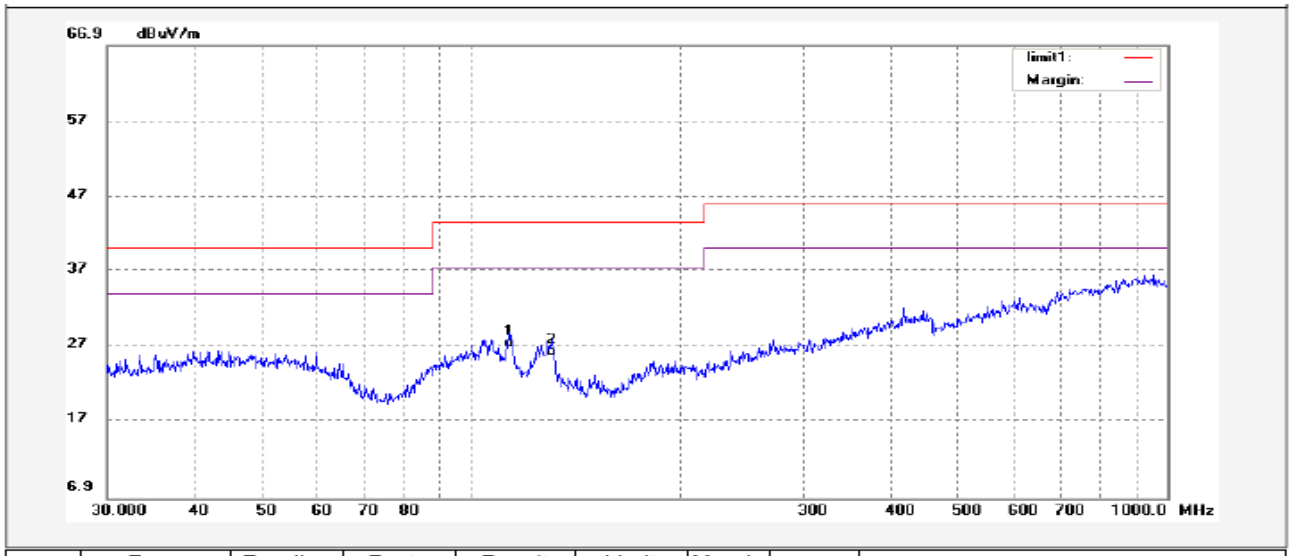
Vertical:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	54.3255	2.82	16.55	19.37	40.00	-20.63	QP	
2	112.0328	5.10	15.59	20.69	43.50	-22.81	QP	

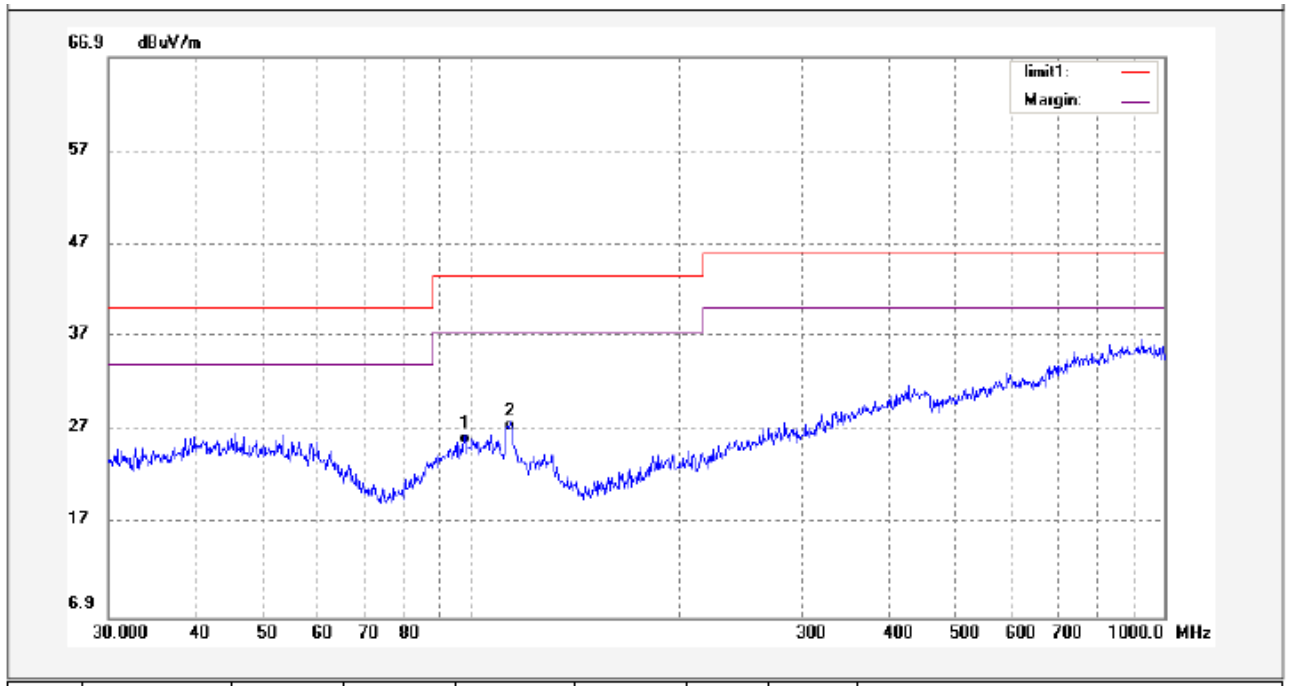
Model : QS-BL101A(6W)

Horizontal:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	113.6185	10.54	15.31	25.85	43.50	-17.65	QP	
2	130.3048	11.17	12.61	23.78	43.50	-19.72	QP	

Vertical:

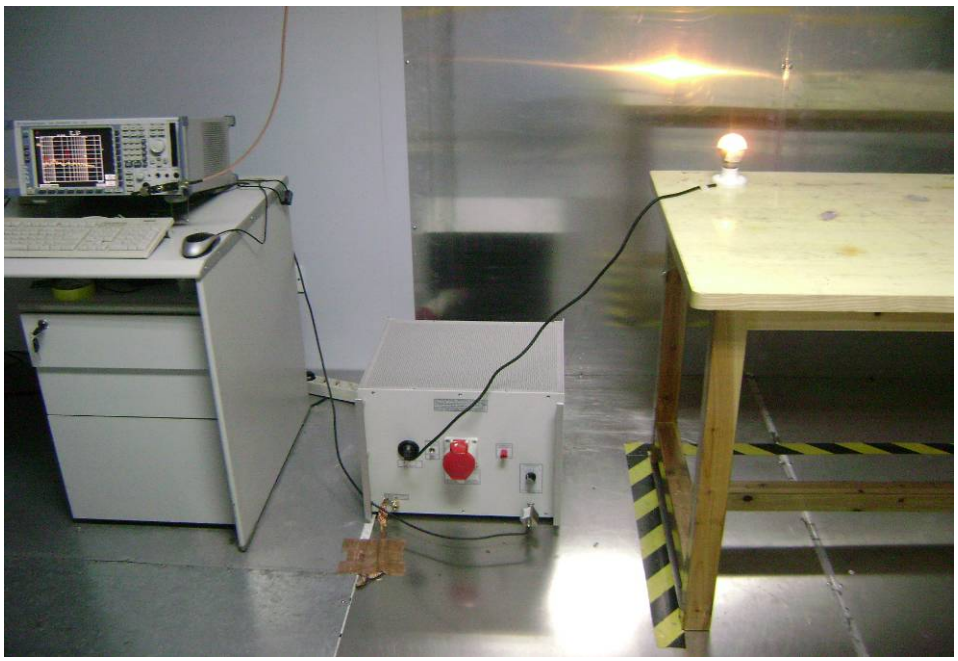


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	98.0302	8.78	16.69	25.47	43.50	-18.03	QP	
2	114.0184	11.57	15.24	26.81	43.50	-16.69	QP	

7 Photographs of Testing

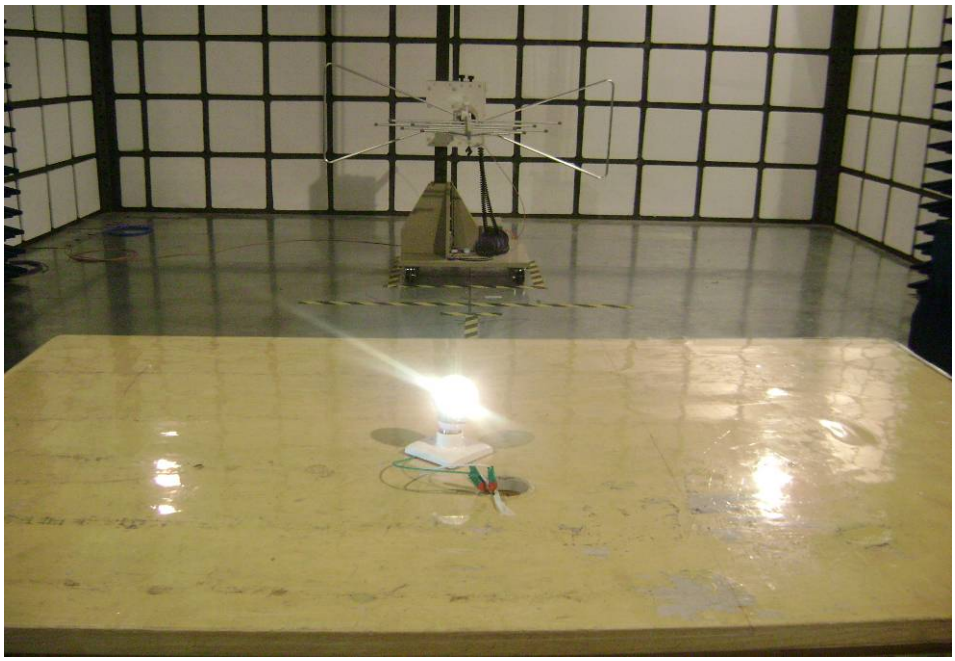
7.1 Conducted Emission Test View

Note : the test setup view of two Model : QS-BL101B and QS-BL101A are the same



7.2 Radiation Emission Test View

Note : the test setup view of two Model : QS-BL101B and QS-BL101A are the same



8 Photographs - Constructional Details

8.1 EUT1 - Side View（Model：QS-BL101B, QS-BL101A）

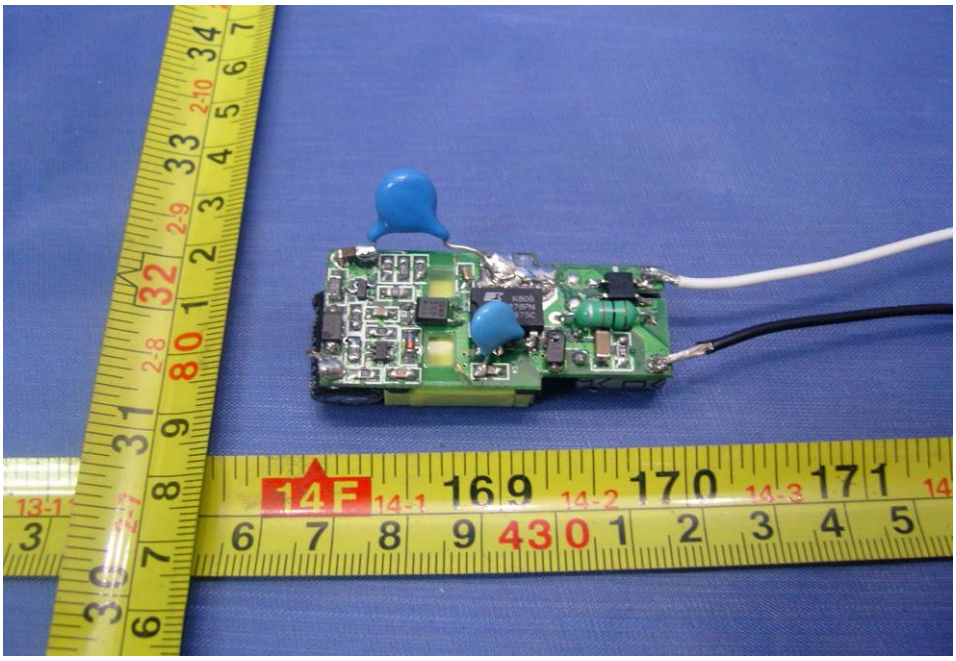
The appearance of both models are the same.

8.2 EUT3 - Side View（Model：QS-PAR30A, QS-PAR30B）

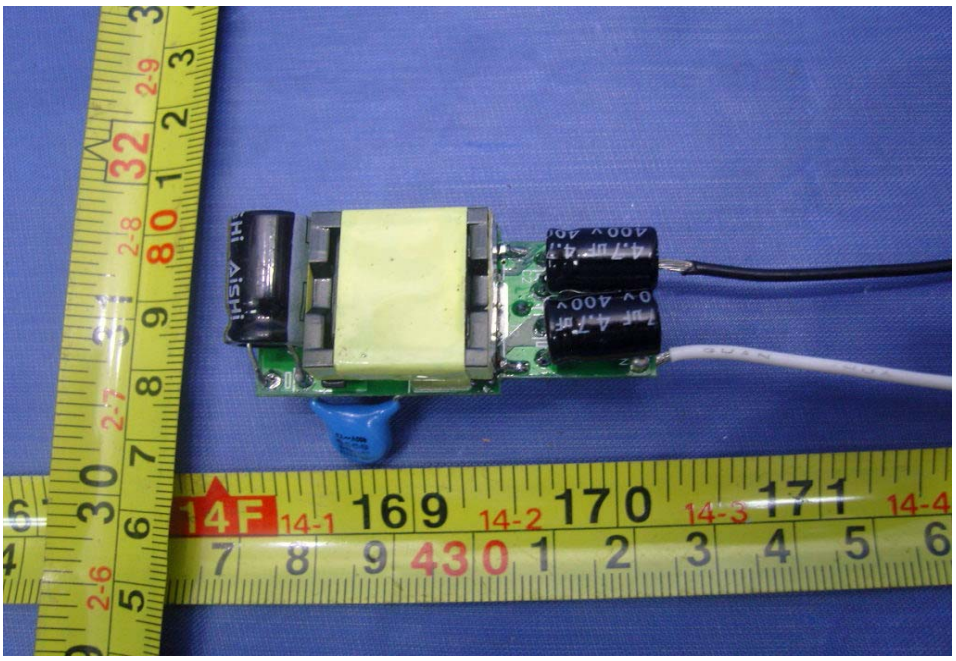
The appearance of both models are the same.

8.3 PCB - Front View

The PCB of the all models are the same



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