

# FCC Part 15C Measurement and Test Report

For

Greenwave Reality Pte Ltd

41 Science Park Road, #03-01, The Gemini, Science Park II,

**FCC ID: Z3M-GLA19147IAJNW**

<b>FCC Rules:</b>	<u>FCC Part 15.249</u>
<b>Product Description:</b>	<u>Self-Ballasted LED-lamps</u>
<b>Tested Model:</b>	<u>LA191-0470IA-JNW1</u>
<b>Report No.:</b>	<u>STR12108216I</u>
<b>Tested Date:</b>	<u>2012-10-25 to 2012-10-29</u>
<b>Issued Date:</b>	<u>2012-10-30</u>
<b>Tested By:</b>	<u>Jack Li / Engineer</u> <i>Jack Li</i>
<b>Reviewed By:</b>	<u>Lahm Peng / EMC Manager</u> <i>Lahm peng</i>
<b>Approved &amp; Authorized By:</b>	<u>Jandy so / PSQ Manager</u> <i>Jandyso</i>
<b>Prepared By:</b>	

**SEM.Test Compliance Service Co., Ltd**  
3/F, Jinbao Commerce Building, Xin'an Fanshen Road,  
Bao'an District, Shenzhen, P.R.C. (518101)  
Tel.: +86-755-33663308 Fax.: +86-755-33663309 Website: www.semtest.com.cn

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by SEM.Test Compliance Service Co., Ltd

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## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment Under Test (EUT)

#### Client Information

Applicant: Greenwave Reality Pte Ltd  
 Address of applicant: 41 Science Park Road, #03-01, The Gemini, Science Park II,  
 Manufacturer: Leeleds Lighting(Xiamen) Co., Ltd.  
 Address of manufacturer: No.5-7, Second Fanghu West Road, Huli District

General Description of EUT	
Product Name:	Self-Ballasted LED-lamps
Trade Name:	GreenWAVE REALITY
Model No.:	LA191-0470IA-JNW1
Adding Model(s):	/
Rated Voltage:	AC120V/60Hz
Power Adapter Model:	/
<i>Note: The test data is gathered from a production sample, provided by the manufacturer.</i>	

Technical Characteristics of EUT	
Frequency Range:	2405-2480MHz
Max. Field Strength:	85.25 dBuV/m (at 3m distance)
Data Rate:	1Mbps
Modulation:	GFSK
Quantity of Channels:	16
Channel Separation:	5MHz
Antenna Type:	Integral Antenna
Antenna Gain:	6.4 dBi

## 1.2 Test Standards

The following report is prepared on behalf of the Greenwave Reality Pte Ltd in accordance with FCC Part 15, Subpart B, Subpart C, and section 15.107, 15.203, 15.205, 15.207, 15.209 and 15.249 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.107,15.203, 15.205, 15.207, 15.209 and 15.249 of the Federal Communication Commissions rules.

**Maintenance of compliance** is the responsibility of the manufacturer. Any modification of the product, which results in lowering the emission, should be checked to ensure compliance has been maintained.

## 1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

## 1.4 Test Facility

- **FCC – Registration No.: 994117**

SEM.Test Compliance Services 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 and the Registration is 994117.

- **Industry Canada (IC) Registration No.: 7673A**

The 3m Semi-anechoic chamber of SEM.Test Compliance Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 7673A.

- **CNAS Registration No.: L4062**

Shenzhen SEM.Test Electronics Service Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C (518101)

## 1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

<b>Test Mode List</b>		
Test Mode	Description	Remark
TM1	Low Channel	2405MHz
TM2	Middle Channel	2440MHz
TM3	High Channel	2480MHz

<b>Special Cable List and Details</b>			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

<b>Auxiliary Equipment List and Details</b>			
Description	Manufacturer	Model	Serial Number
/	/	/	/

## 2. SUMMARY OF TEST RESULTS

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<b>FCC Rules</b>	<b>Description of Test Item</b>	<b>Result</b>
§ 15.203	Antenna Requirement	Compliant
§15.205	Restricted Band of Operation	Compliant
§ 15.207(a)	Conducted Emission	Compliant
§ 15.209(a)(f)	Radiated Supirous Emissions	Compliant
§15.249(a)	Field Strength of Emissions	Compliant
§15.249(d)	Out of Band Emission	Compliant
§15.215 (c)	Emission Bandwidth	Compliant

### **3. Antenna Requirements**

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#### **3.1 Standard Applicable**

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

#### **3.2 Test Result**

This product has an integral antenna, fulfill the requirement of this section.

## 4. Radiated Emissions

### 4.1 Measurement Uncertainty

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is  $\pm 5.10$  dB.

### 4.2 Standard Applicable

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field strength of fundamental (milli-volts/meter)	Field strength of fundamental (micro-volts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

### 4.3 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2012-03-28	2013-03-27
EMI Test Receiver	R&S	ESVB	825471/005	2012-03-28	2013-03-27
Pre-amplifier	Agilent	8447F	3113A06717	2012-03-28	2013-03-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2012-03-28	2013-03-27
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2012-02-25	2013-02-24
Horn Antenna	ETS	3117	00086197	2012-02-25	2013-02-24
Loop Antenna	SCHWARZECK	HFRA 5165	9365	2012-02-25	2013-02-24

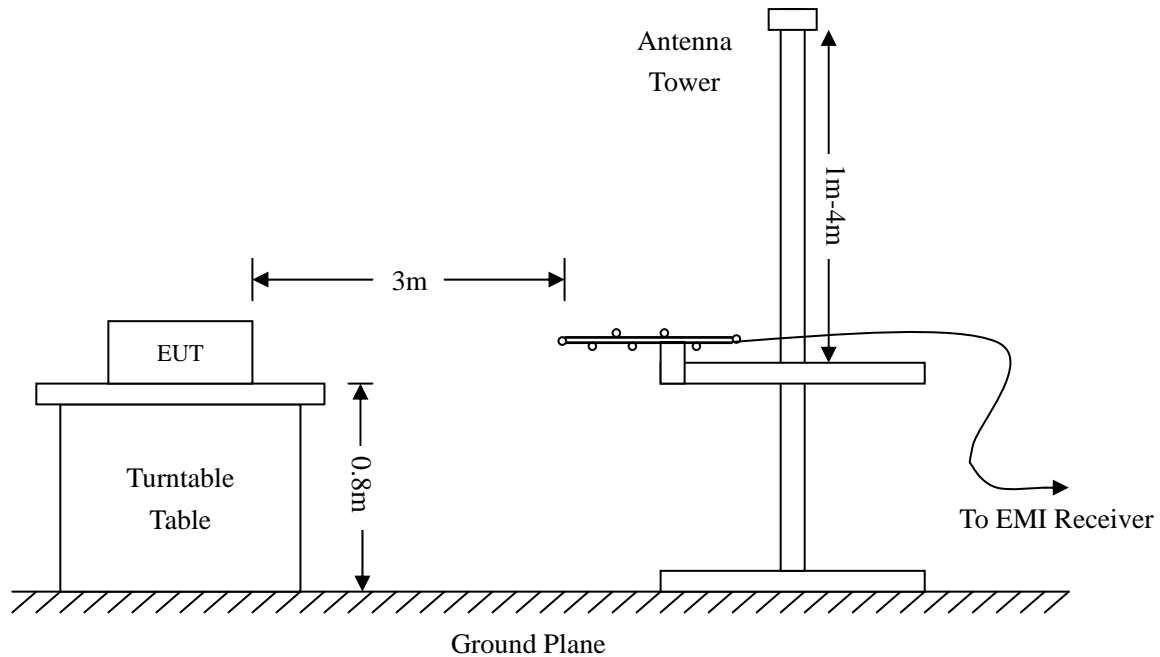


#### 4.4 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.205 15.249(a) and FCC Part 15.209 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.



#### 4.5 Corrected Amplitude & Margin Calculation

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

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

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of  $-6\text{dB}\mu\text{V}$  means the emission is  $6\text{dB}\mu\text{V}$  below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15C Limit}$$

#### 4.6 Environmental Conditions

Temperature:	24 °C
Relative Humidity:	60 %
ATM Pressure:	1012 mbar

### 4.7 Summary of Test Results/Plots

According to the data below, the FCC Part 15.205, 15.209 and 15.249 standards, and had the worst margin of:

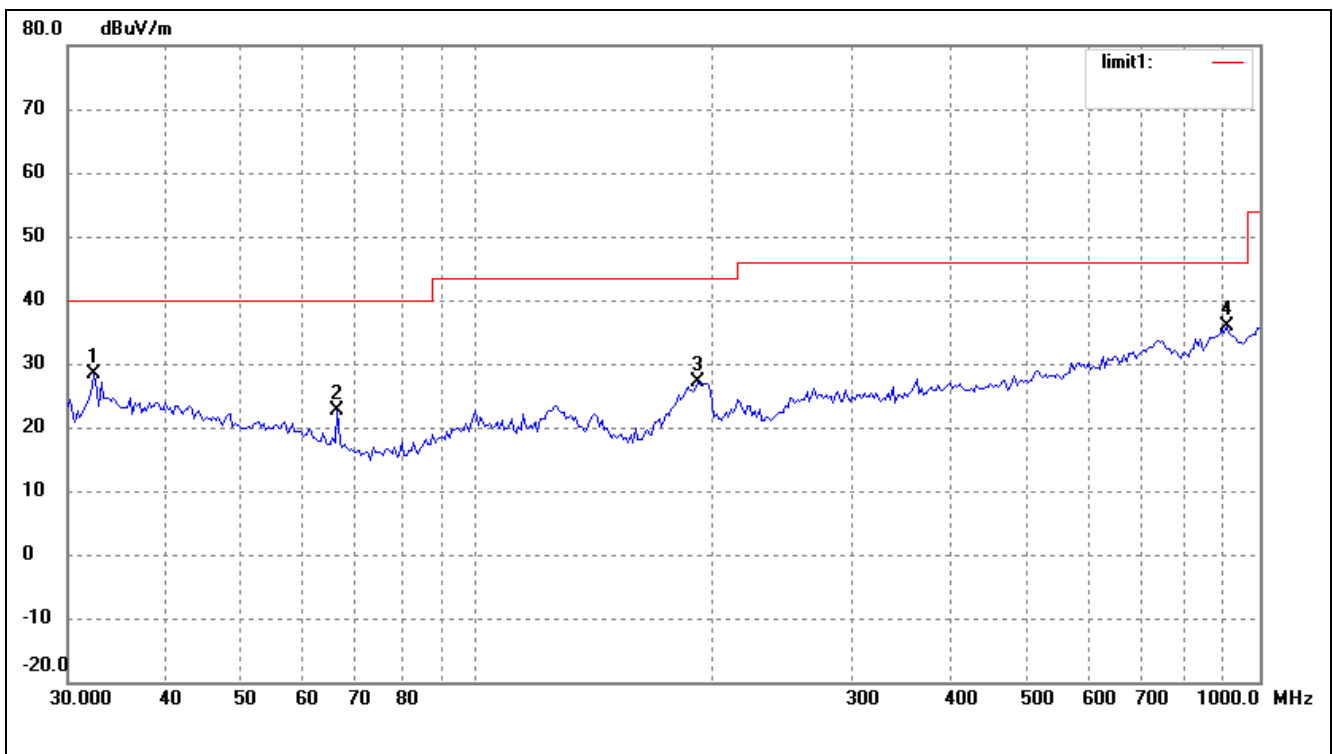
**-7.06 dB $\mu$ V at 4960 MHz in the Horizontal polarization, High Channel, Average detector , 9 kHz to 25 GHz, 3Meters**

*Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.*

#### Plot of Radiated Emissions Test Data (30MHz to 1GHz)

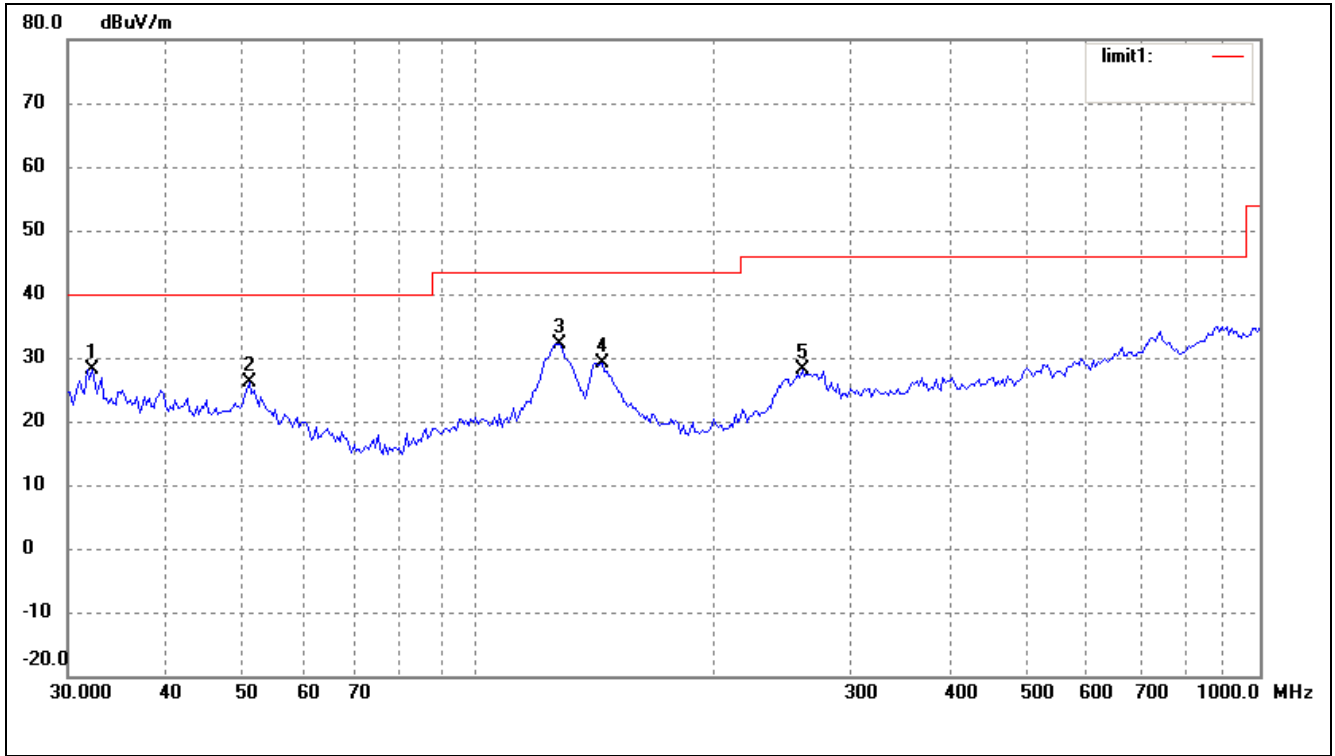
EUT: *Self-Ballasted LED-lamps*  
 Tested Model: *LA191-0470IA-JNW1*  
 Operating Condition: *Transmitting Low Channel (2405MHz)*  
 Comment: *AC120V/60Hz*

Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	32.4059	20.00	8.44	28.44	40.00	-11.56	360	100	peak
2	66.2662	18.89	3.71	22.60	40.00	-17.40	360	100	peak
3	191.0738	22.93	4.24	27.17	43.50	-16.33	360	100	peak
4	906.4824	16.67	19.15	35.82	46.00	-10.18	360	100	peak

Test Specification: Vertical

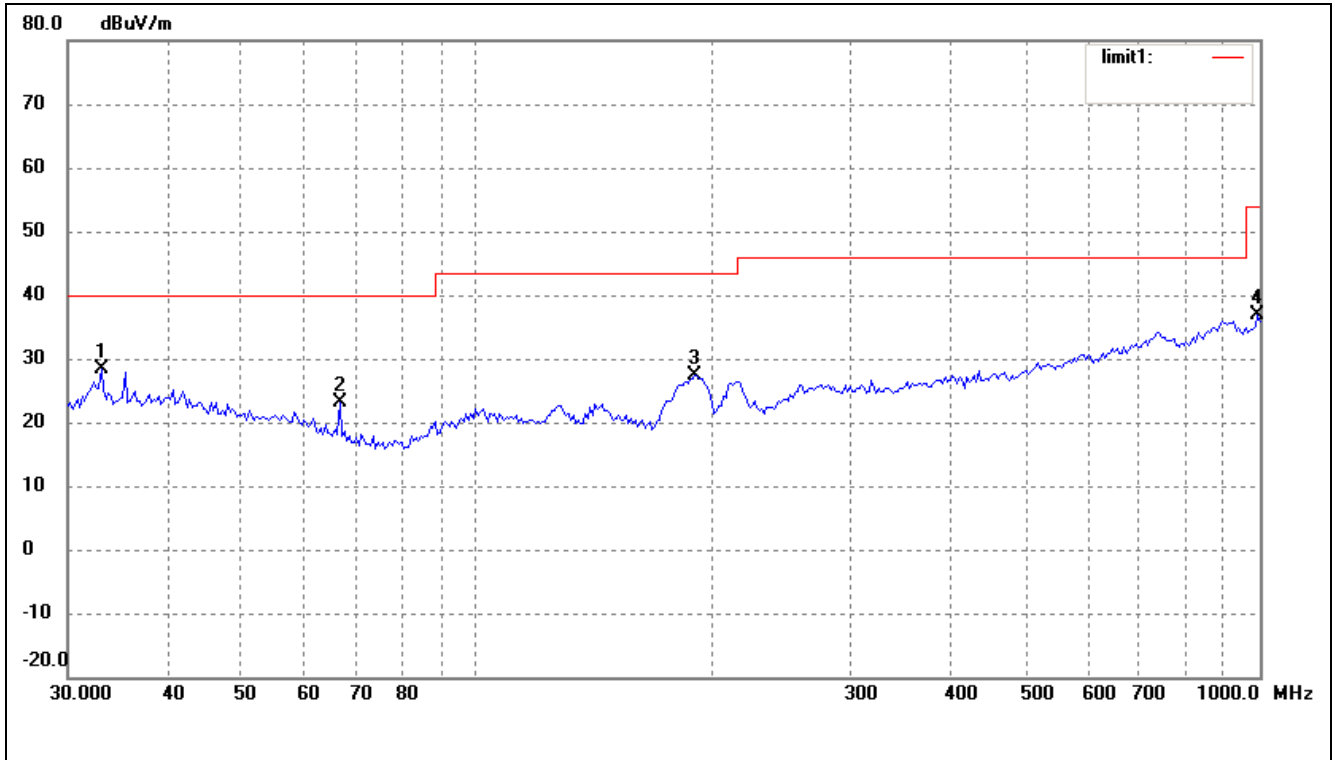


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	32.1795	19.84	8.41	28.25	40.00	-11.75	360	100	peak
2	51.1209	19.53	6.51	26.04	40.00	-13.96	360	100	peak
3	127.2176	27.84	4.34	32.18	43.50	-11.32	360	100	peak
4	144.3348	25.69	3.46	29.15	43.50	-14.35	360	100	peak
5	260.1444	20.38	7.72	28.10	46.00	-17.90	360	100	peak

Operating Condition: Transmitting Middle Channel (2440MHz)

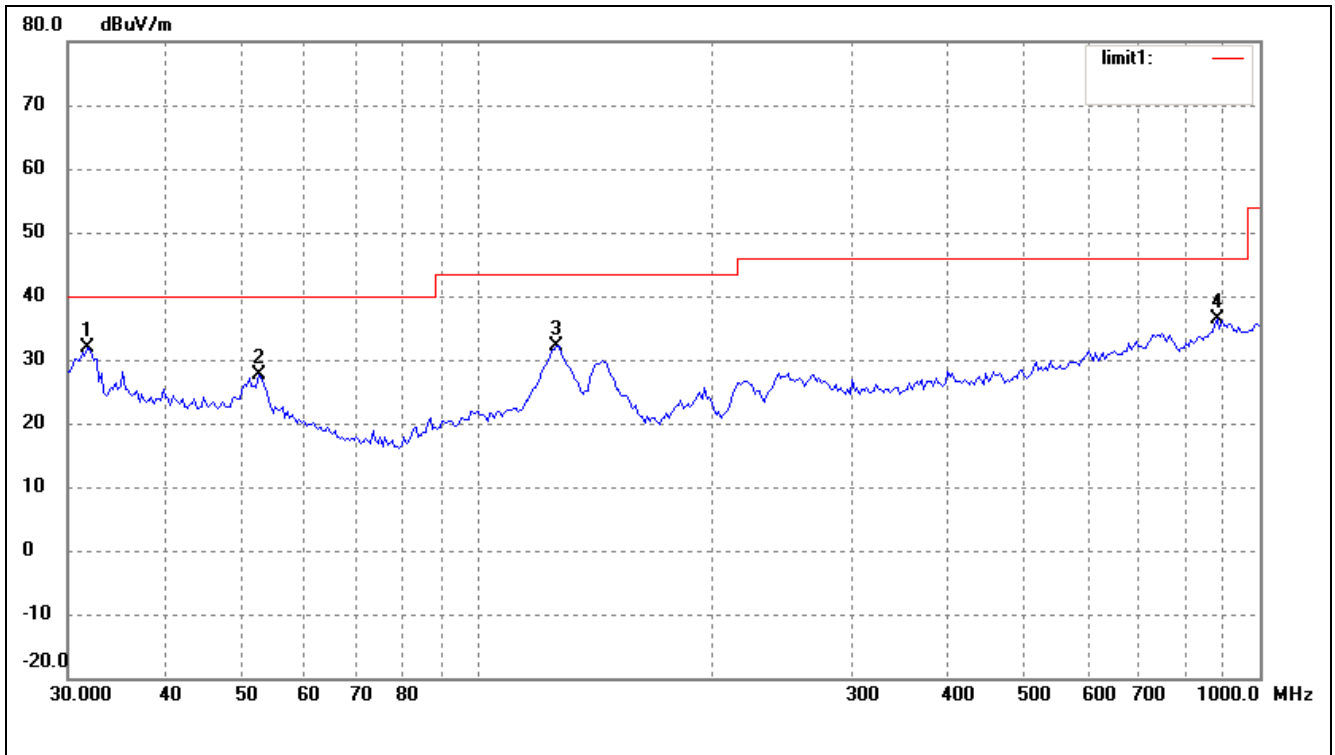
Comment: AC120V/60Hz

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	33.0950	19.88	8.56	28.44	40.00	-11.56	360	100	peak
2	66.7325	19.68	3.57	23.25	40.00	-16.75	360	100	peak
3	189.7385	23.17	4.19	27.36	43.50	-16.14	360	100	peak
4	993.0114	17.27	19.53	36.80	54.00	-17.20	360	100	peak

Test Specification: Vertical

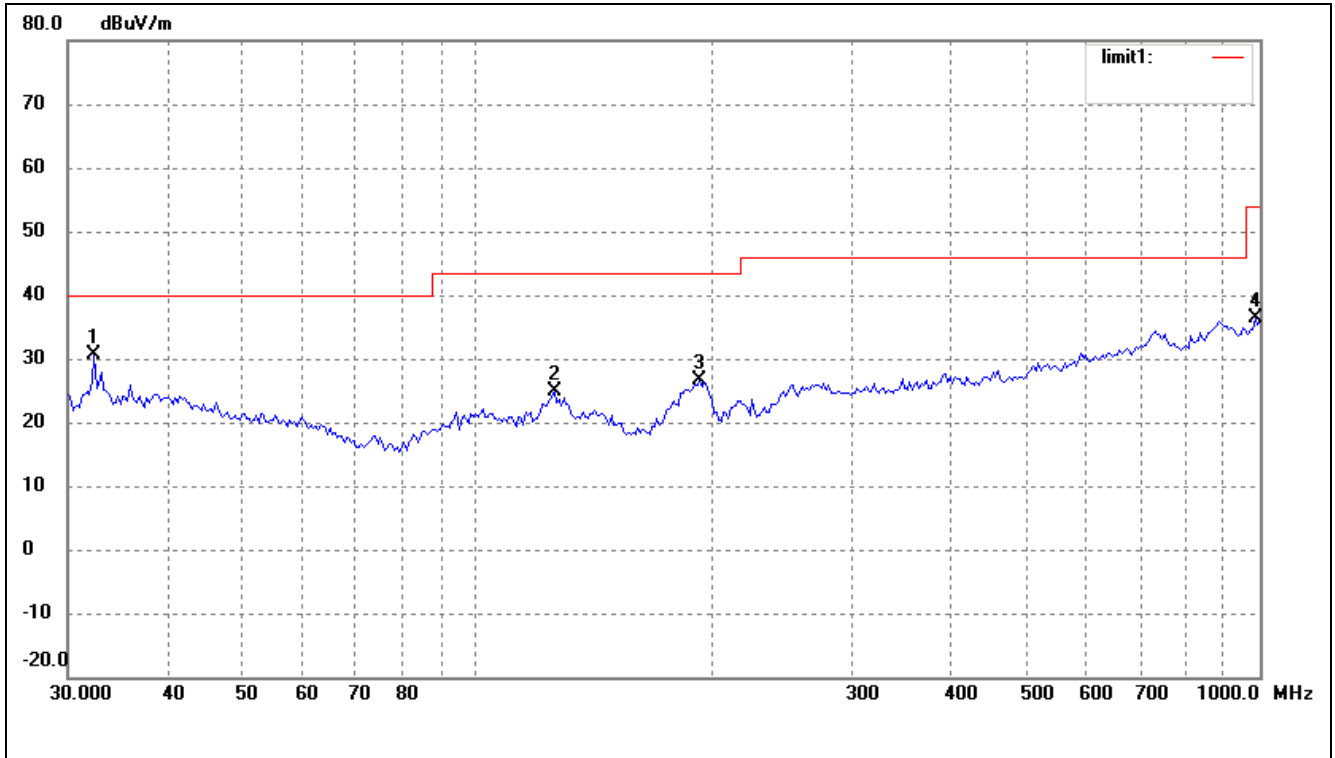


No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	31.7313	23.62	8.33	31.95	40.00	-8.05	360	100	peak
2	52.5753	21.31	6.38	27.69	40.00	-12.31	360	100	peak
3	126.3286	27.82	4.39	32.21	43.50	-11.29	360	100	peak
4	881.4067	17.31	19.03	36.34	46.00	-9.66	360	100	peak

Operating Condition: Transmitting High Channel (2480MHz)

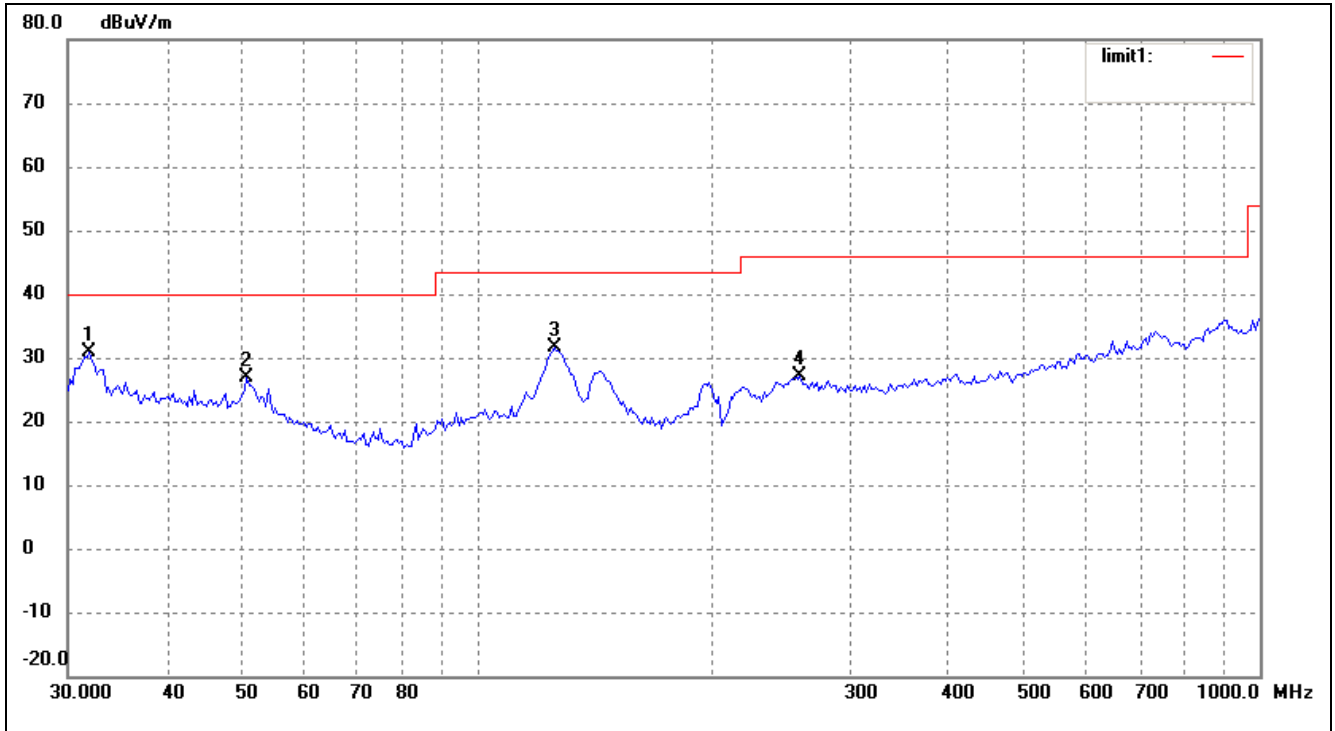
Comment: AC120V/60Hz

Test Specification: Horizontal



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	32.4059	22.12	8.44	30.56	40.00	-9.44	360	100	peak
2	125.4457	20.47	4.46	24.93	43.50	-18.57	360	100	peak
3	192.4186	22.30	4.31	26.61	43.50	-16.89	360	100	peak
4	986.0717	17.30	19.17	36.47	54.00	-17.53	360	100	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (°)	Height (cm)	Remark
1	31.9546	22.61	8.37	30.98	40.00	-9.02	360	100	peak
2	50.7637	20.46	6.54	27.00	40.00	-13.00	360	100	peak
3	125.4457	27.18	4.46	31.64	43.50	-11.86	360	100	peak
4	258.3264	19.53	7.64	27.17	46.00	-18.83	360	100	peak

*Spurious Emissions Above 1GHz*

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2405MHz							
2405	91.17	-11.75	79.42	114	-34.58	H	PK
2405	70.25	-11.75	58.50	94	-35.50	H	AV
4810	56.95	-3.92	53.03	74	-20.97	H	PK
4810	39.79	-3.92	35.87	54	-18.13	H	AV
7215	45.85	1.05	46.90	74	-27.10	H	PK
7215	34.49	1.03	35.52	54	-18.48	H	AV
2405	95.21	-11.75	83.46	114	-30.54	V	PK
2405	75.19	-11.75	63.44	94	-30.56	V	AV
4810	52.63	-3.92	48.71	74	-25.29	V	PK
4810	37.10	-3.92	33.18	54	-20.82	V	AV
7215	46.22	1.05	47.27	74	-26.73	V	PK
7215	34.22	1.05	35.37	54	-18.63	V	AV
Middle Channel-2440MHz							
2440	93.52	-11.77	81.75	114	-32.25	H	PK
2440	70.88	-11.75	59.13	94	-34.87	H	AV
4880	62.67	-3.74	58.93	74	-15.07	H	PK
4880	43.71	-3.74	39.97	54	-14.03	H	AV
7320	46.32	1.50	47.82	74	-25.96	H	PK
7320	34.75	1.50	36.25	54	-17.75	H	AV
2440	95.99	-11.77	84.22	114	-29.78	V	PK
2440	72.01	-11.75	60.26	94	-33.74	V	AV
4880	56.68	-3.74	52.94	74	-21.06	V	PK
4880	39.37	-3.74	35.63	54	-18.37	V	AV
7320	46.32	1.50	47.82	74	-26.18	V	PK
7320	34.59	1.50	36.09	54	-17.91	V	AV



Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2480MHz							
2480	94.24	-11.77	82.47	114	-31.53	H	PK
2480	70.39	-11.78	58.61	94	-35.39	H	AV
4960	69.82	-3.48	66.34	74	-7.66	H	PK
4960	50.42	-3.48	46.94	54	-7.06	H	AV
7440	47.53	2.04	49.57	74	-24.43	H	PK
7440	35.12	2.04	37.18	54	-16.82	H	AV
2480	97.02	-11.77	85.25	114	-28.75	V	PK
2480	70.88	-11.78	59.10	94	-34.90	V	AV
4960	64.56	-3.48	61.08	74	-12.92	V	PK
4960	46.02	-3.48	42.54	54	-11.46	V	AV
7440	46.14	2.04	48.18	74	-25.82	V	PK
7440	34.81	2.04	36.95	54	-17.05	V	AV

*Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 5<sup>th</sup> Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*

*The measurements greater than 20dB below the limit from 9kHz to 30MHz..*

## 5. Out of Band Emissions

### 5.1 Standard Applicable

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

### 5.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2012-03-28	2013-03-27
EMI Test Receiver	R&S	ESVB	825471/005	2012-03-28	2013-03-27
Pre-amplifier	Agilent	8447F	3113A06717	2012-03-28	2013-03-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2012-03-28	2013-03-27
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2012-02-25	2013-02-24
Horn Antenna	ETS	3117	00086197	2012-02-25	2013-02-24

### 5.3 Test Procedure

As the radiation test, set the Lowest and Highest Transmitting Channel, observed the outside band of 2400MHz to 2483.5MHz, than mark the higher-level emission for comparing with the FCC rules.

### 5.4 Environmental Conditions

Temperature:	24 °C
Relative Humidity:	60 %
ATM Pressure:	1012 mbar

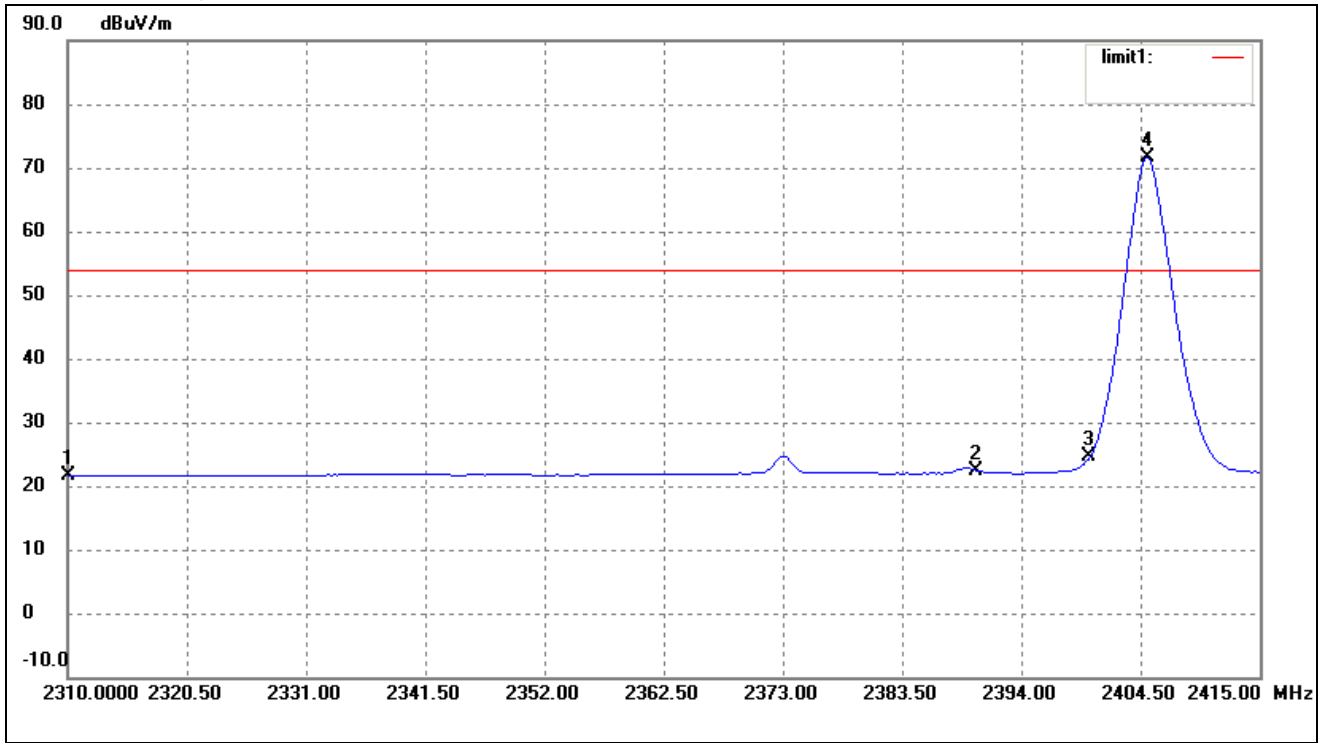
### 5.5 Summary of Test Results/Plots

Test mode	Frequency	Limit	Result
	MHz	dBuV / dBc	
Lowest	2310.00	<54 dBuV	Pass
	2390.00	<54 dBuV	Pass
	2400.00	<54 dBuV	Pass
Highest	2483.50	<54 dBuV	Pass
	2500.00	<54 dBuV	Pass

The edge emissions are below the FCC 15.209 Limits or complies with the 15.247(d) requirements.

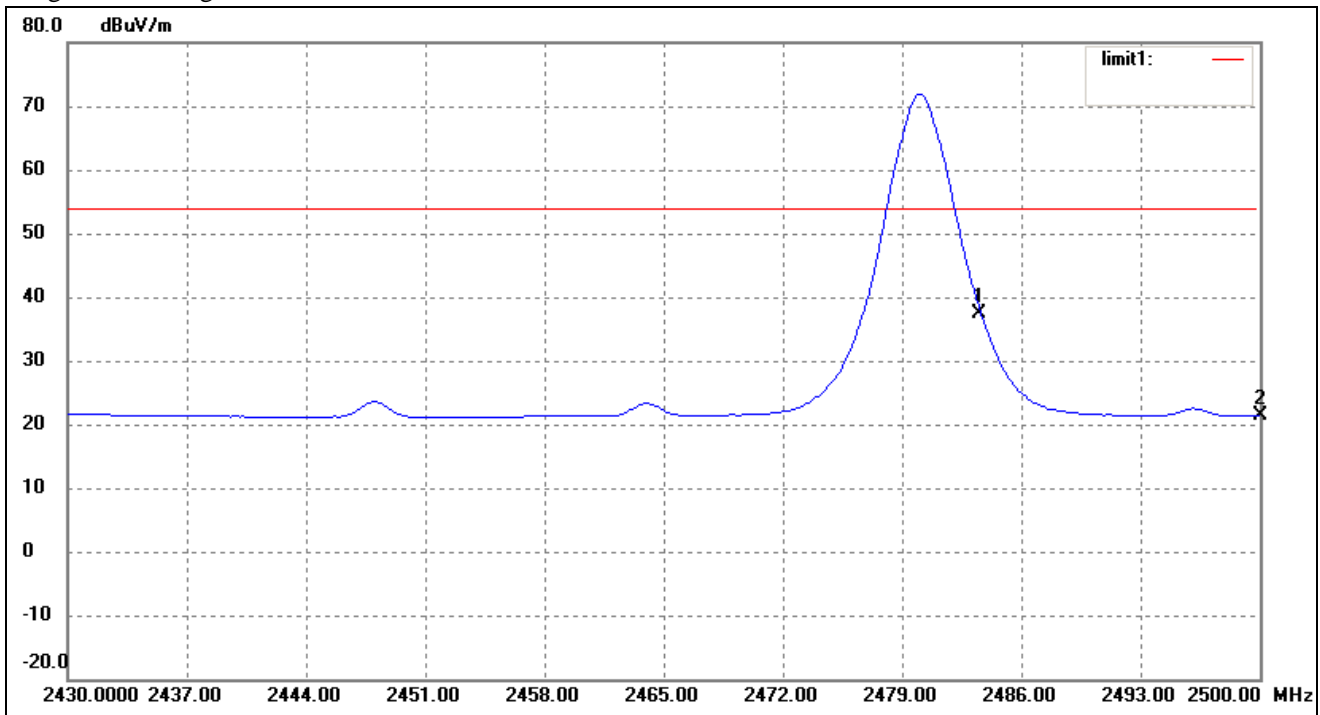
Please refer to the test plots as below.

Lowest Bandedge



No.	Frequency (MHz)	Reading (dBuV/m)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2310.000	33.38	-11.72	21.66	54.00	-32.34	Ave Detector
	2310.000	47.46	-11.72	35.74	74.00	-38.26	Peak Detector
2	2390.000	34.21	-11.75	22.46	54.00	-31.54	Ave Detector
	2390.000	48.05	-11.75	36.30	74.00	-37.70	Peak Detector
3	2400.000	36.49	-11.75	24.74	54.00	-29.26	Ave Detector
	2400.000	51.62	-11.75	39.87	74.00	-34.13	Peak Detector

Highest Bandedge



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	49.27	-11.78	37.49	54.00	-16.51	Ave Detector
	2483.500	59.82	-11.78	48.04	74.00	-25.96	Peak Detector
2	2500.000	33.14	-11.78	21.36	54.00	-32.64	Ave Detector
	2500.000	48.02	-11.78	36.24	74.00	-37.76	Peak Detector

## 6. Emission Bandwidth

### 6.1 Standard Applicable

According to 15.215 (c), intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

### 6.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2012-03-28	2013-03-27
Attenuator	ATTEN	ATS100-4-20	/	2012-03-28	2013-03-27

### 6.3 Test Procedure

According to the ANSI 63.4-2003, the emission bandwidth test method as follows.

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

Set span = 1MHz, centered on a transmitting channel

RBW  $\geq$ 1% 20dB Bandwidth, VBW  $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

All the trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission, use the marker-delta function to measure and record the 20dB down and 99% bandwidth of the emission.

### 6.4 Environmental Conditions

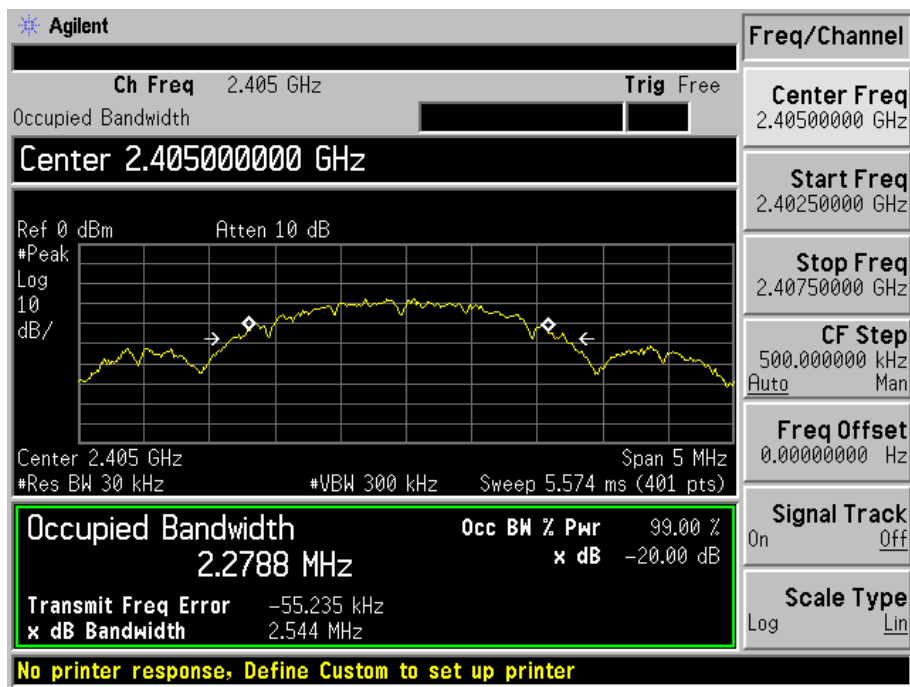
Temperature:	25 °C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

### 6.5 Summary of Test Results/Plots

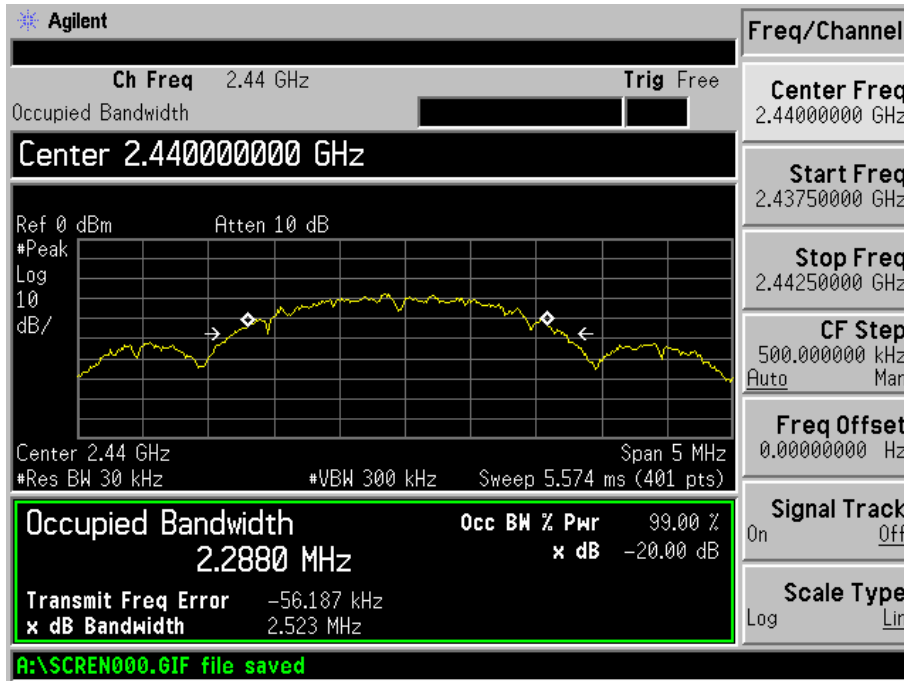
Channel	Frequency MHz	20dB Bandwidth kHz	99% Bandwidth kHz
Low Channel	2405	2544.0	2278.8
Middle Channel	2440	2523.0	2288.0
High Channel	2480	2512.0	2276.9

Please refer to the following test plots

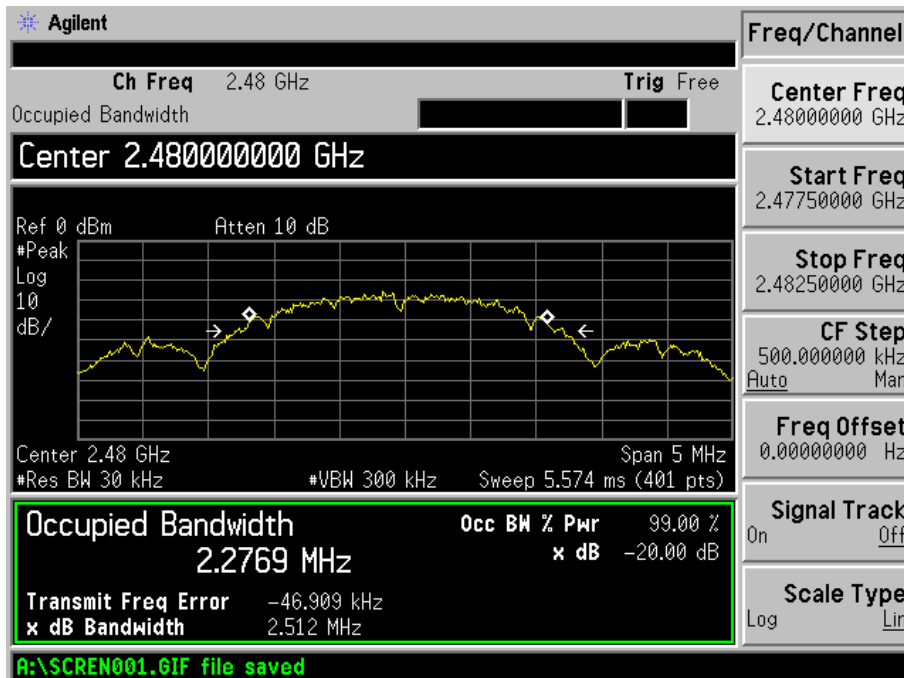
Low Channel:



Middle Channel:



High Channel:



## 7. Conducted Emissions

### 7.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is  $\pm 2.88$  dB.

### 7.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2012-03-28	2013-03-27
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2012-03-28	2013-03-27
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2012-03-28	2013-03-27

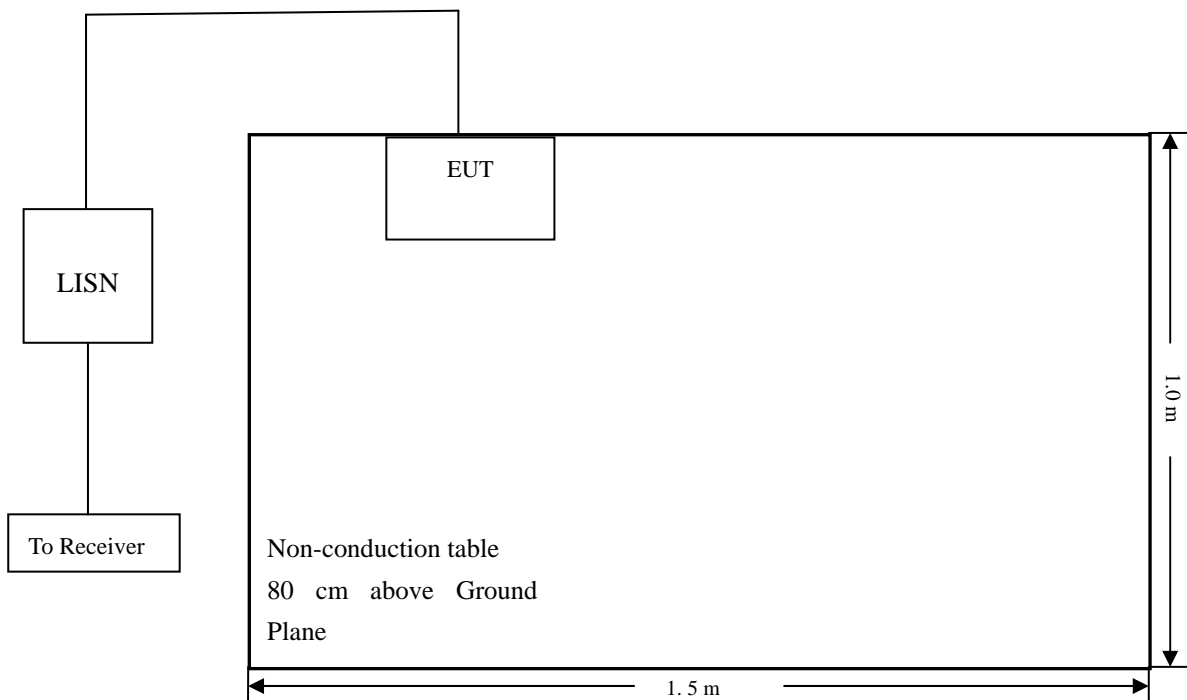
### 7.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

### 7.4 Basic Test Setup Block Diagram





## 7.5 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

## 7.6 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency ..... 150 kHz  
 Stop Frequency..... 30 MHz  
 Sweep Speed ..... Auto  
 IF Bandwidth..... 10 kHz  
 Quasi-Peak Adapter Bandwidth ..... 9 kHz  
 Quasi-Peak Adapter Mode ..... Normal

## 7.7 Summary of Test Results/Plots

According to the data in section 3.8, the EUT complied with the FCC Part 15.207 Conducted margin for a Class B device, with the *worst* margin reading of:

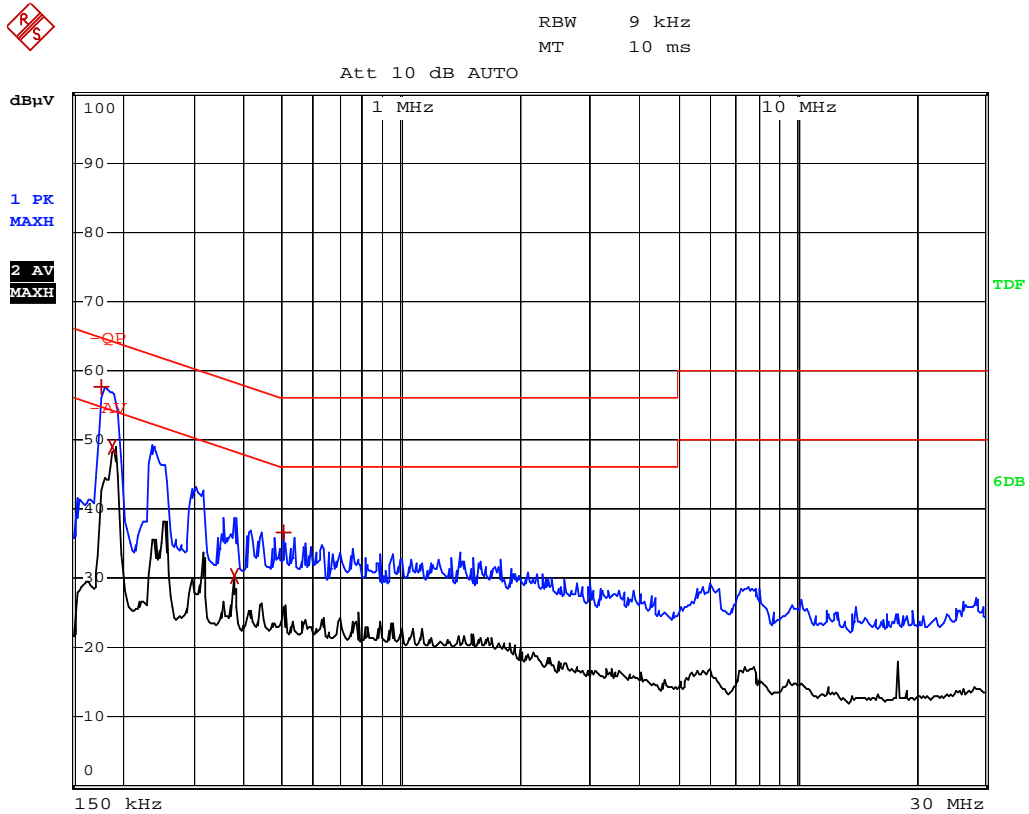
**-4.36 dB $\mu$ V at 0.186 MHz in the Neutral mode, Ave detector, 0.15-30MHz**

## 7.8 Conducted Emissions Test Data

**Plot of Conducted Emissions Test Data**

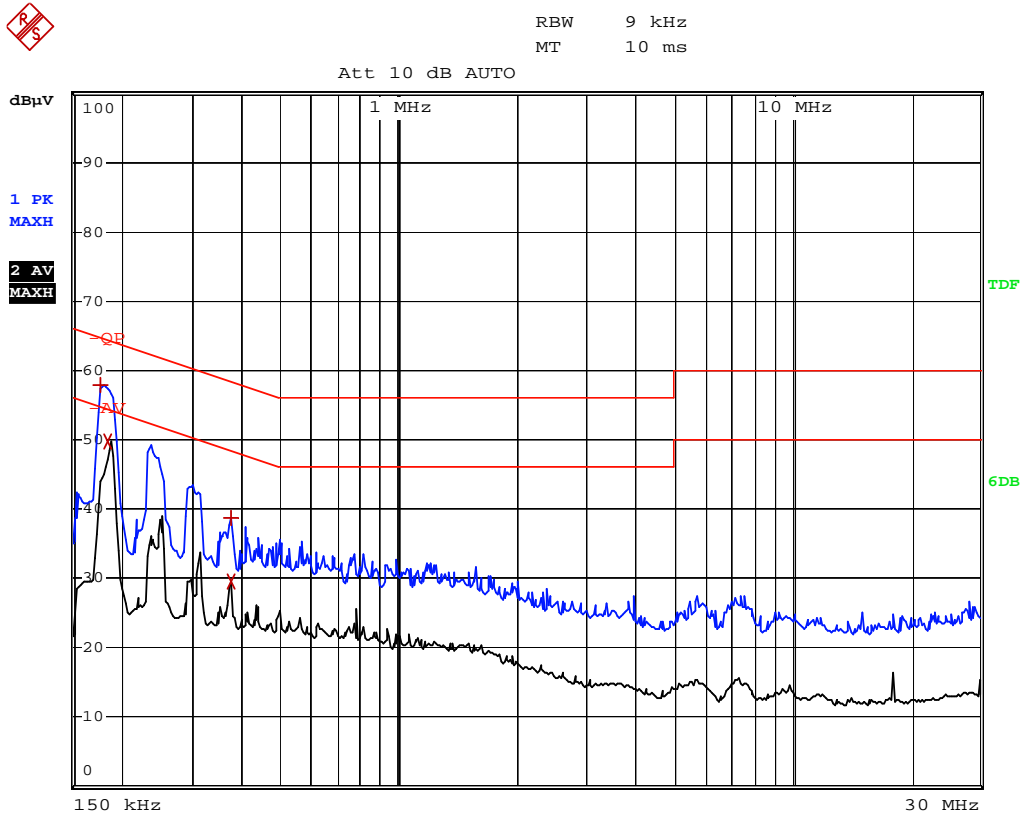
EUT: Self-Ballsated LED-lamps  
 Tested Model: LA191-0470IA-JNW1  
 Operating Condiation: Transmitting  
 Comment: AC120V/60Hz

Test Specification: Line



EDIT PEAK LIST (Prescan Results)			
Trace1:	-QP		
Trace2:	-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Max Peak	178 kHz	57.62	-6.95
2 Average	190 kHz	48.84	-5.19
2 Average	378 kHz	30.38	-17.93
1 Max Peak	506 kHz	36.70	-19.29

Test Specification: Neutral



EDIT PEAK LIST (Prescan Results)			
TRACE		FREQUENCY	LEVEL dBµV
Trace1:	-QP		
Trace2:	-AV		
Trace3:	---		
1	Max Peak	178 kHz	57.78
2	Average	186 kHz	49.84
1	Max Peak	374 kHz	38.82
2	Average	374 kHz	29.47
			DELTA LIMIT dB
			-6.79
			-4.36
			-19.59
			-18.93

\*\*\*\*\* END OF REPORT \*\*\*\*\*