

# FCC Part 15B

## Measurement and Test Report

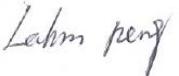
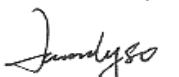
For

**TECHCity Technology Co., Ltd.**

**4F., No.4, Aly. 1, Siwei Ln., Zhongzheng Rd., Xindian Dist.,**

**New Taipei City 231, Taiwan( R.O.C.)**

**FCC ID: UQOLC-321S**

<b>Test Standards:</b>	<u>FCC Part 15 Subpart B</u>
<b>Product Description:</b>	<u>Light Switch</u>
<b>Tested Model:</b>	<u>LC-321S</u>
<b>Report No.:</b>	<u>STR12108004I</u>
<b>Tested Date:</b>	<u>2012-10-8 to 2012-12-15</u>
<b>Issued Date:</b>	<u>2013-01-16</u>
<b>Tested By:</b>	<u>Daniel Liu / Engineer</u> 
<b>Reviewed By:</b>	<u>Lahm Peng / EMC Manager</u> 
<b>Approved &amp; Authorized By:</b>	<u>Jandy so / PSQ Manager</u> 
<b>Prepared By:</b>	<b>SEM.Test Compliance Service Co., Ltd</b> 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: <a href="http://www.semtest.com.cn">www.semtest.com.cn</a>

Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permission 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: TECHCity Technology Co., Ltd.  
Address of applicant: 4F., No.4, Aly. 1, Siwei Ln., Zhongzheng Rd.,  
Xindian Dist., New Taipei City 231, Taiwan( R.O.C.)  
Manufacturer: TECHCity Technology Co., Ltd.  
Address of manufacturer: 4F., No.4, Aly. 1, Siwei Ln., Zhongzheng Rd.,  
Xindian Dist., New Taipei City 231, Taiwan( R.O.C.)

<b>General Description of EUT</b>	
Product Name:	Light Switch
Trade Name:	e-live
Model No.:	LC-321S
Adding Model(s):	/

*Note: The test data is gathered from a production sample, provided by the manufacturer.*

<b>Technical Characteristics of EUT</b>	
Frequency Range:	433.92 MHz (Rx)
Antenna Type:	Integral Antenna
Modulation:	ASK
Rated Voltage:	AC 100~240V
Rated Current:	10A
Rated Power:	1000W
Lowest Internal Frequency:	4MHz

## 1.2 Test Standards

The following report is prepared on behalf of the TECHCity Technology Co., Ltd. in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart B, and section 15.205, 15.107, and 15.109 rules.

**Maintenance of compliance** is the responsibility of the manufacturer. Any modification of the product, which result 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 Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted according to the operation manual for use, more detailed description as follows:

Test Mode List:

Test Mode	Description	Remark
TM1	Operating	/

EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

Auxiliary Equipment List and Details

Description	Manufacturer	Model	Serial Number
/	/	/	/

Special Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
/	/	/	/

## 2. SUMMARY OF TEST RESULTS

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FCC Rules	Description of Test Item	Result
§ 15.107 (a)	Conducted Emissions	Compliant
§ 15.109 (a)	Radiated Emissions	Compliant

N/A: not applicable

### 3. Conducted Emissions

#### 3.1 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.

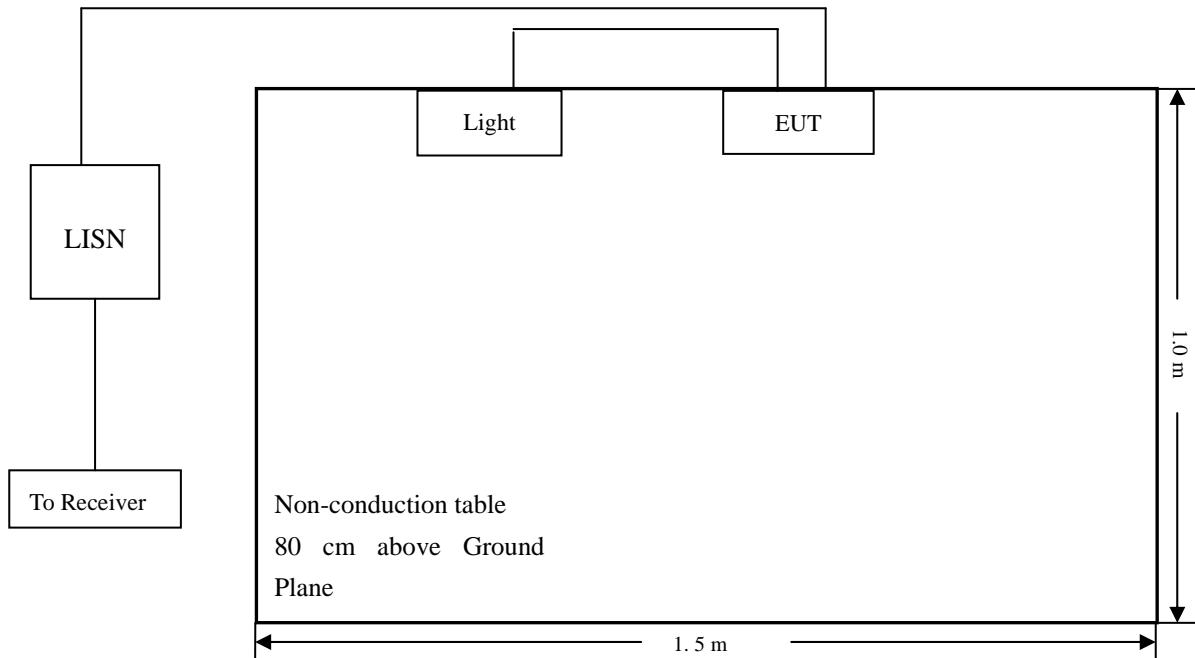
#### 3.2 Test Equipment List and Details

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

#### 3.3 Test Procedure

Test is conducting under the description of 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.

#### 3.4 Basic Test Setup Block Diagram



### 3.5 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	52%
ATM Pressure:	1011 mbar

### 3.6 Summary of Test Results/Plots

According to the data in section 3.7, the EUT complied with the FCC Part 15.107(a) Conducted margin for a Class B device, with the *worst* margin reading of:

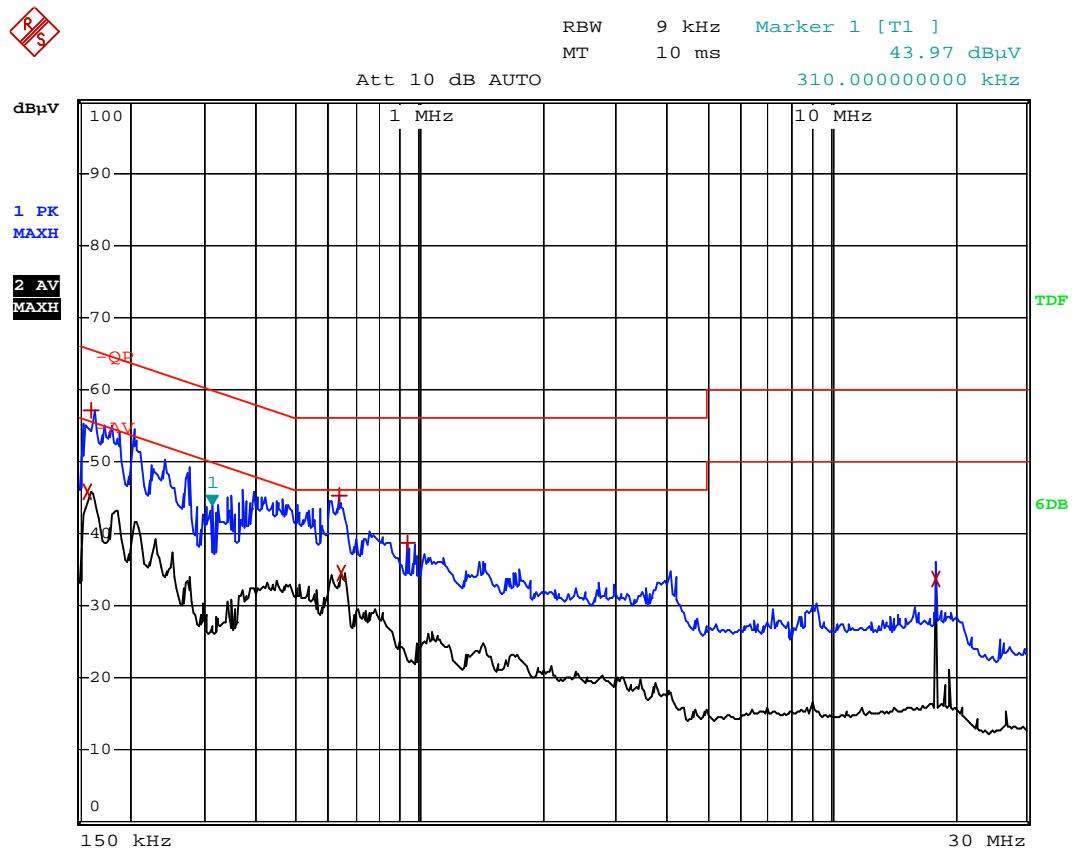
**-4.61 dB at 0.170 MHz in the Neutral, Peak detector, 0.15-30MHz**

### 3.7 Conducted Emissions Test Data

## Plot of Conducted Emissions Test Data

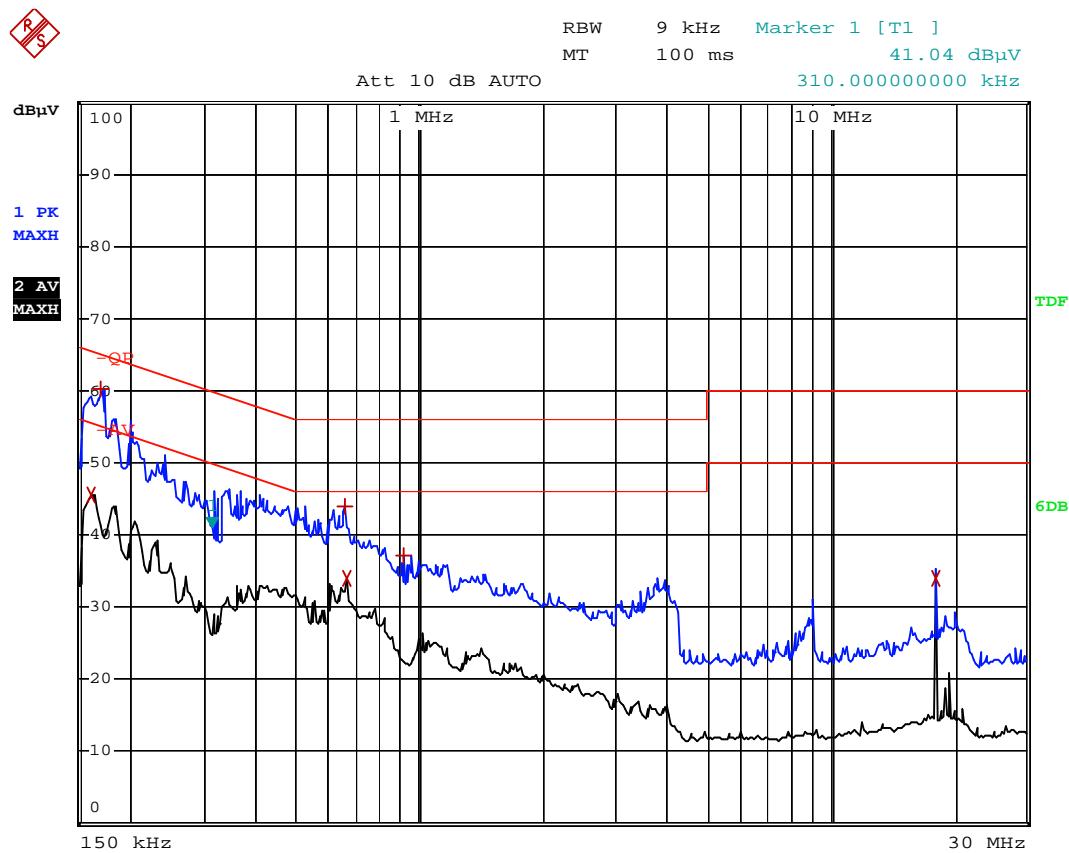
*EUT:* *Light Switch*  
*Tested Model:* *LC-321S*  
*Operating Condition:* *Operating*  
*Comment:* *AC 120V/60Hz*

*Test Specification:* *Neutral*



EDIT PEAK LIST (Prescan Results)					
TRACE	FREQUENCY	LEVEL	dBuV	DELTA	LIMIT
2 Average	158 kHz	45.80		-9.75	
1 Max Peak	162 kHz	56.99		-8.36	
1 Max Peak	634 kHz	45.21		-10.78	
2 Average	646 kHz	34.59		-11.40	
1 Max Peak	938 kHz	38.68		-17.31	
2 Average	17.986 MHz	33.79		-16.20	

Test Specification: Line



EDIT PEAK LIST (Prescan Results)				
Trace1:	-QP			
Trace2:	-AV			
Trace3:	---			
TRACE	FREQUENCY	LEVEL dB $\mu$ V	DELTA	LIMIT dB
2 Average	162 kHz	45.58		-9.77
1 Max Peak	170 kHz	60.34		-4.61
1 Max Peak	654 kHz	44.04		-11.96
2 Average	666 kHz	33.99		-12.00
1 Max Peak	918 kHz	37.17		-18.82
2 Average	17.986 MHz	33.99		-16.00

## 4. Radiated Emissions

### 4.1 Measurement Uncertainty

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

### 4.2 Test Equipment List and Details

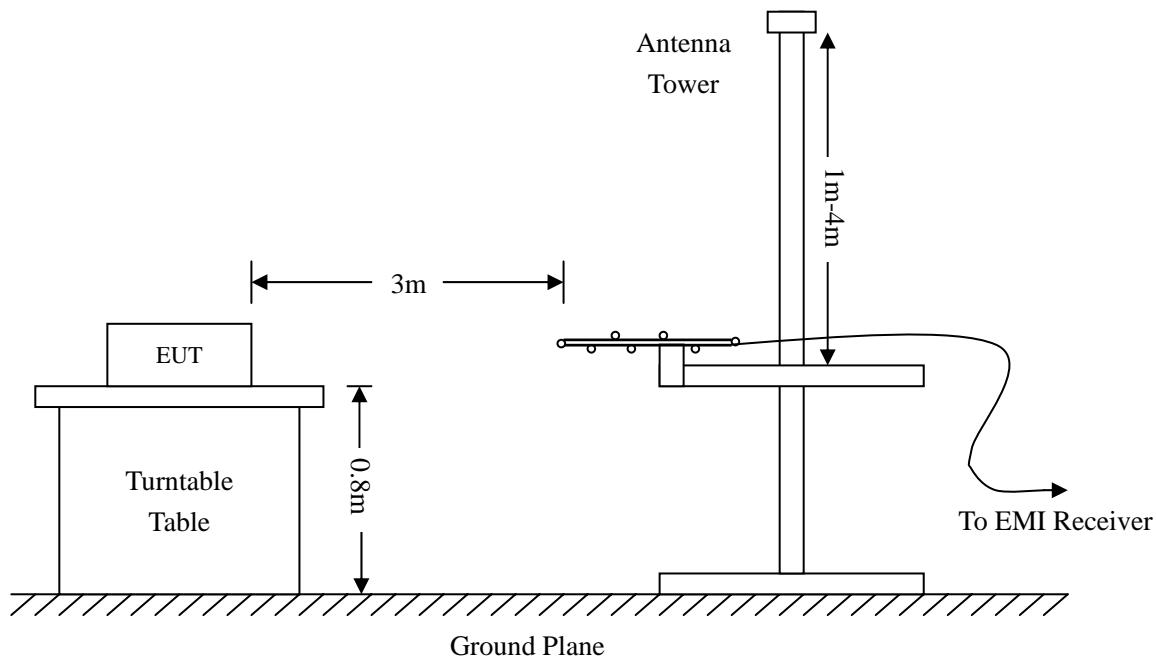
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2012-03-28	2013-03-27
EMI Test Receiver	R&S	ESVB	825471/005	2012-03-28	2013-03-27
Pre-amplifier	Agilent	8447F	3113A06717	2012-03-28	2013-03-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2012-03-28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

### 4.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.109 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.



#### 4.4 Test Receiver Setup

During the radiated emission test for above 1GHz, the test receiver was set with the following configurations:

For peak detector:

RBW = 1000kHz, VBW = 3000kHz, Sweep Time = Auto

For average detector:

RBW = 1000kHz, VBW = 10Hz, Sweep Time = Auto

#### 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:

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

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

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15.109(a) Limit}$$

#### 4.6 Environmental Conditions

Temperature:	23 °C
Relative Humidity:	55 %
ATM Pressure:	1011 mbar

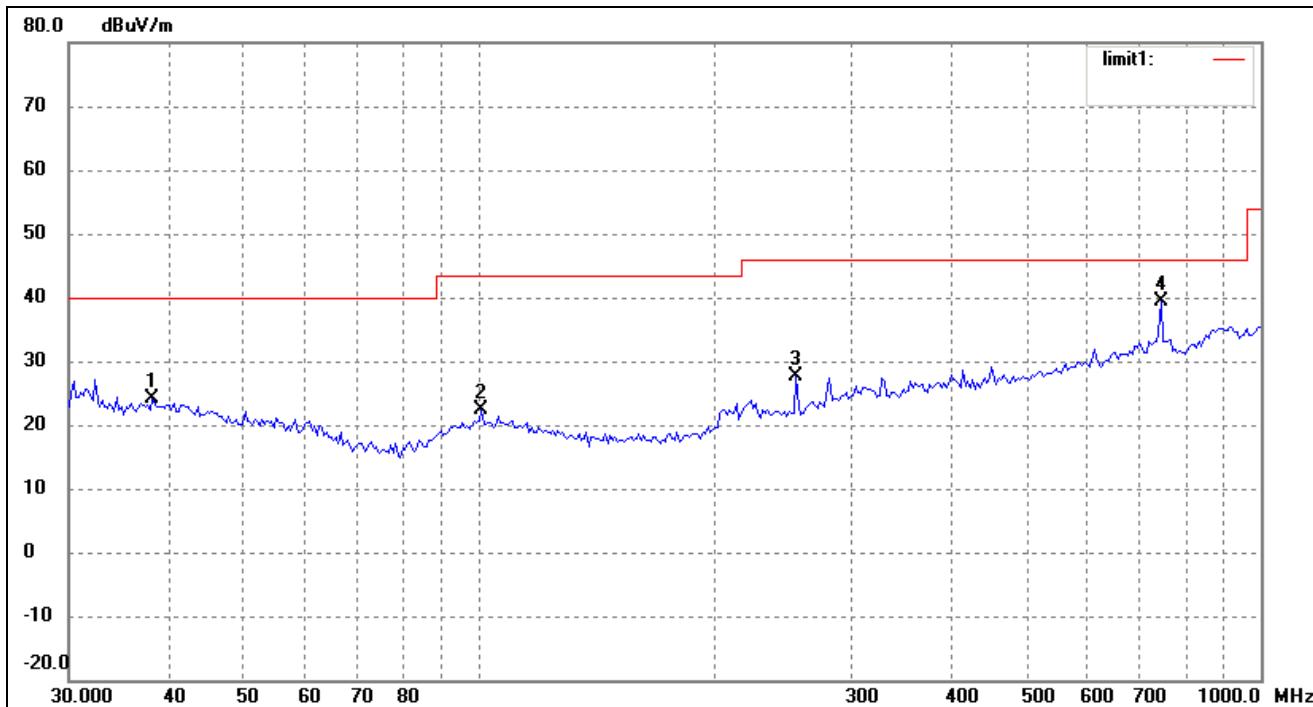
#### 4.7 Summary of Test Results/Plots

According to the data, the EUT complied with the FCC Part 15.109(a) rule, and had the worst margin of:

**-6.50 dB at 744.8661 MHz in the Horizontal polarization, 9 kHz to 5 GHz, 3Meters**

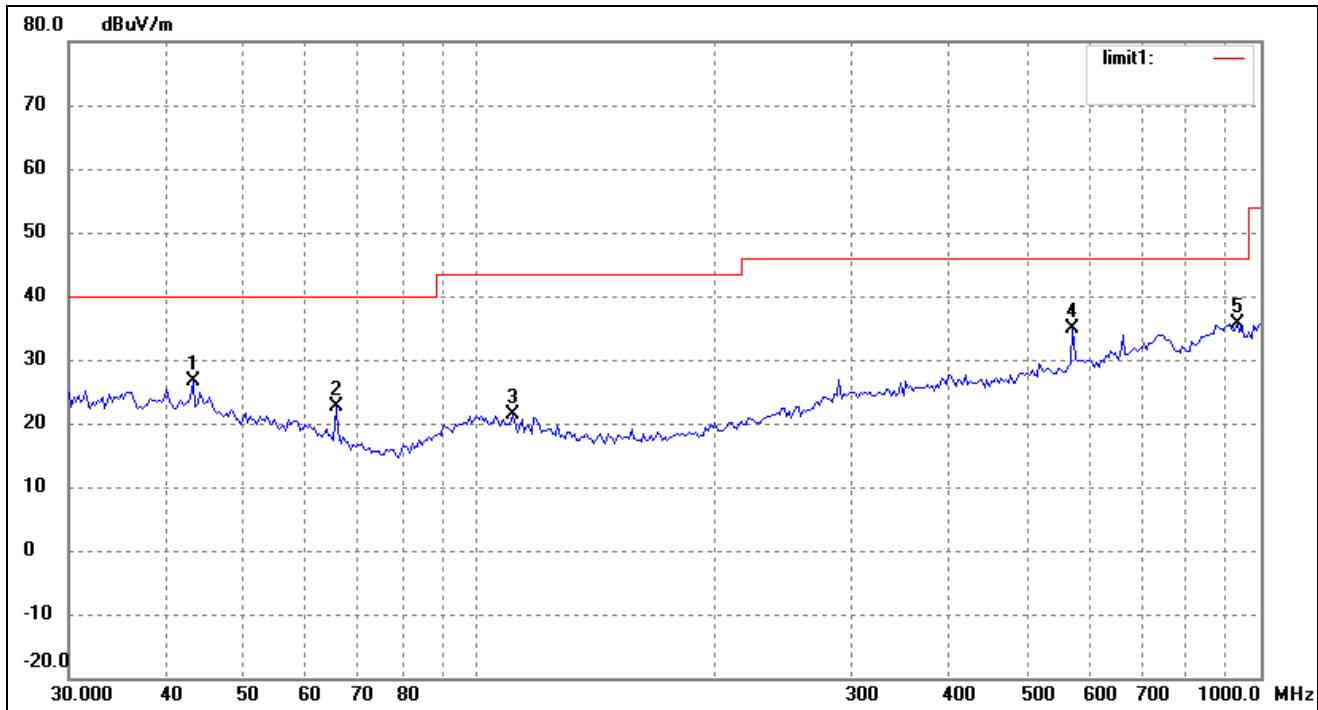
**Plot of Radiated Emissions Test Data**

EUT: *Light Switch*  
 Tested Model: *LC-321S*  
 Operating Condition: *Operating*  
 Comment: *AC 120V/60Hz*  
 Test Specification: *Horizontal*



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (•)	Height (cm)	Remark
1	38.3462	14.72	9.42	24.14	40.00	-15.86	144	100	peak
2	100.9340	15.65	6.75	22.40	43.50	-21.10	323	100	peak
3	254.7284	20.20	7.48	27.68	46.00	-18.32	267	150	peak
4	744.8661	21.55	17.95	39.50	46.00	-6.50	198	100	peak

Test Specification: Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (•)	Height (cm)	Remark
1	43.2017	17.97	8.70	26.67	40.00	-13.33	346	100	peak
2	65.8031	18.70	3.85	22.55	40.00	-17.45	317	100	peak
3	110.5687	15.65	5.80	21.45	43.50	-22.05	278	100	peak
4	574.6258	20.82	13.95	34.77	46.00	-11.23	163	100	peak
5	932.2715	17.42	18.31	35.73	46.00	-10.27	224	100	peak

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..

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