

FCC Part 15B

Measurement and Test Report

For

Guangde Ledup Enterprise Inc.

Jingtang Road, Economic Development Zone, Xuanchang, China

FCC ID: 2AEBH-HSLSL0608

FCC Rule(s): FCC Part 15 Subpart B

Product Description: control box for light string

Tested Model: 8HSTR7-1801E2

Report No.: STR18058031I

Sample Receipt Date: 2018-04-27

Tested Date: 2018-04-28 to 2018-05-09

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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 Shenzhen SEM Test Technology Co., Ltd.

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Guangde Ledup Enterprise Inc.
Address of applicant: Jingtang Road, Economic Development Zone,
Xuanchang, China

Manufacturer: Guangde Ledup Enterprise Inc.
Address of manufacturer: Jingtang Road, Economic Development Zone,
Xuanchang, China

General Description of EUT	
Product Name:	control box for light string
Trade Name:	LEDUP
Model No.:	8HSTR7-1801E2
Adding Model(s):	SL xx, (xx represents the number of 06-20); 6HSTR7-1801E2
<i>Note: The test data is gathered from a production sample, provided by the manufacturer. The appearance of others models listed in the report is different from main-test model 8HSTR7-1801E2, but the circuit and the electronic construction do not change, declared by the manufacturer.</i>	

Technical Characteristics of EUT	
Rated Voltage:	AC120V/60Hz
Rated Current:	/
Rated Power:	/
Power Adapter Model:	/
Highest Internal Frequency:	433.92MHz RX
Classification of ITE:	Class B

1.2 Test Standards

The following report is prepared on behalf of the Guangde Ledup Enterprise Inc. 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 C63.4-2014, 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.: 125990

Shenzhen SEM Test Technology Co., Ltd. Laboratory has been recognized to perform compliance testing on equipment subject to the Commissions Declaration Of Conformity (DOC). The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A

The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

1.5 EUT Setup and Operation Mode

The equipment under test (EUT) was configured to measure its highest possible emission. 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	433.92MHz Receiving	/

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
Lights	5.5	Unshielded	Without Core

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
Conducted Emissions	Conducted	9-150kHz $\pm 3.74\text{dB}$
		0.15-30MHz $\pm 3.34\text{dB}$
Radiated Emissions	Radiated	30-200MHz $\pm 4.52\text{dB}$
		0.2-1GHz $\pm 5.56\text{dB}$
		1-6GHz $\pm 3.84\text{dB}$
		6-18GHz $\pm 3.92\text{dB}$

1.7 Test Equipment List and Details

Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
Spectrum Analyzer	Agilent	E4407B	MY41440400	2017-06-12	2018-06-11
Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2017-06-12	2018-06-11
EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2017-06-12	2018-06-11
Amplifier	Agilent	8447F	3113A06717	2017-06-12	2018-06-11
Amplifier	C&D	PAP-1G18	2002	2017-06-12	2018-06-11
Broadband Antenna	Schwarz beck	VULB9163	9163-333	2017-06-08	2020-06-07
Horn Antenna	ETS	3117	00086197	2017-06-08	2020-06-07
Loop Antenna	Schwarz beck	FMZB 1516	9773	2017-06-08	2020-06-07
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2017-06-12	2018-06-11
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2017-06-12	2018-06-11
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2017-06-12	2018-06-11



2. SUMMARY OF TEST RESULTS

Description of Test	Result
§15.107 (a) Conducted Emission	Compliant
§15.109(a) Radiated Emission	Compliant

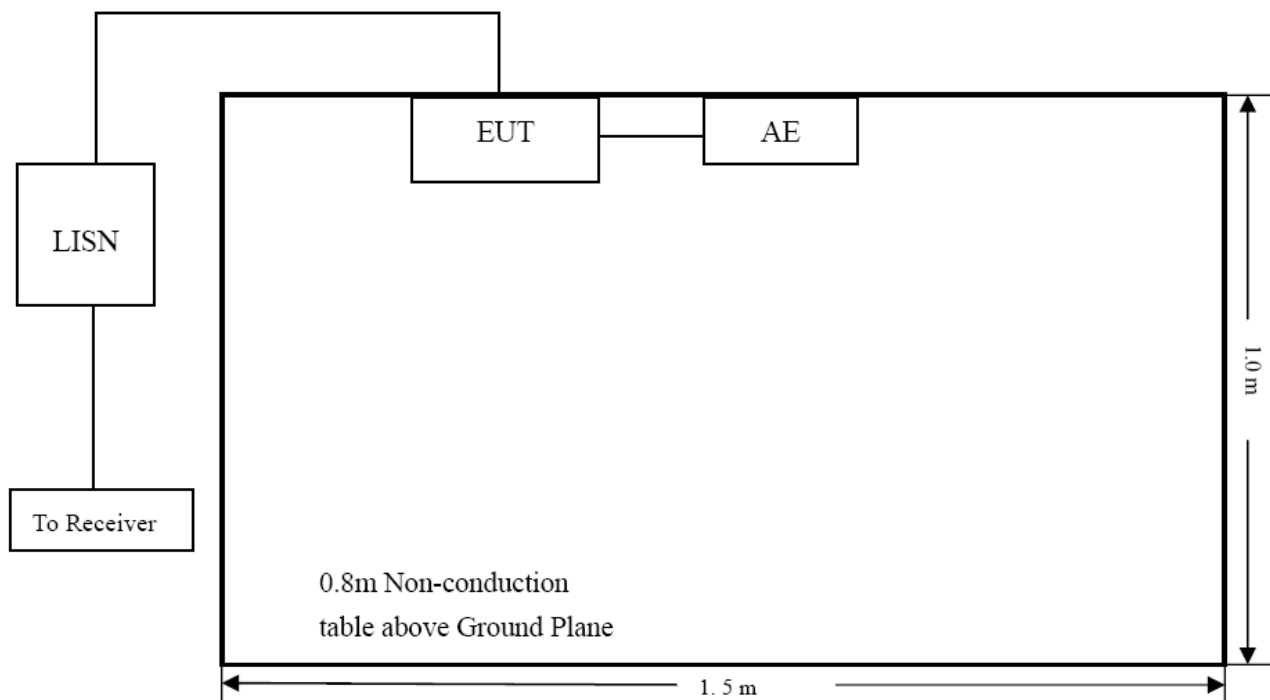
N/A: not applicable

3. Conducted Emissions

3.1 Test Procedure

Test is conducting under the description of ANSI C63.4-2014, 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.

3.2 Basic Test Setup Block Diagram



3.3 Environmental Conditions

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

3.4 Summary of Test Results/Plots

According to the data in section 3.5, the EUT complied with the FCC Part 15.107(a) Conducted margin for a Class B device, with the *worst* margin reading of:

-1.37 dB at 0.8100 MHz in the Neutral, QP detector, TM1 mode, 0.15-30MHz

3.5 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

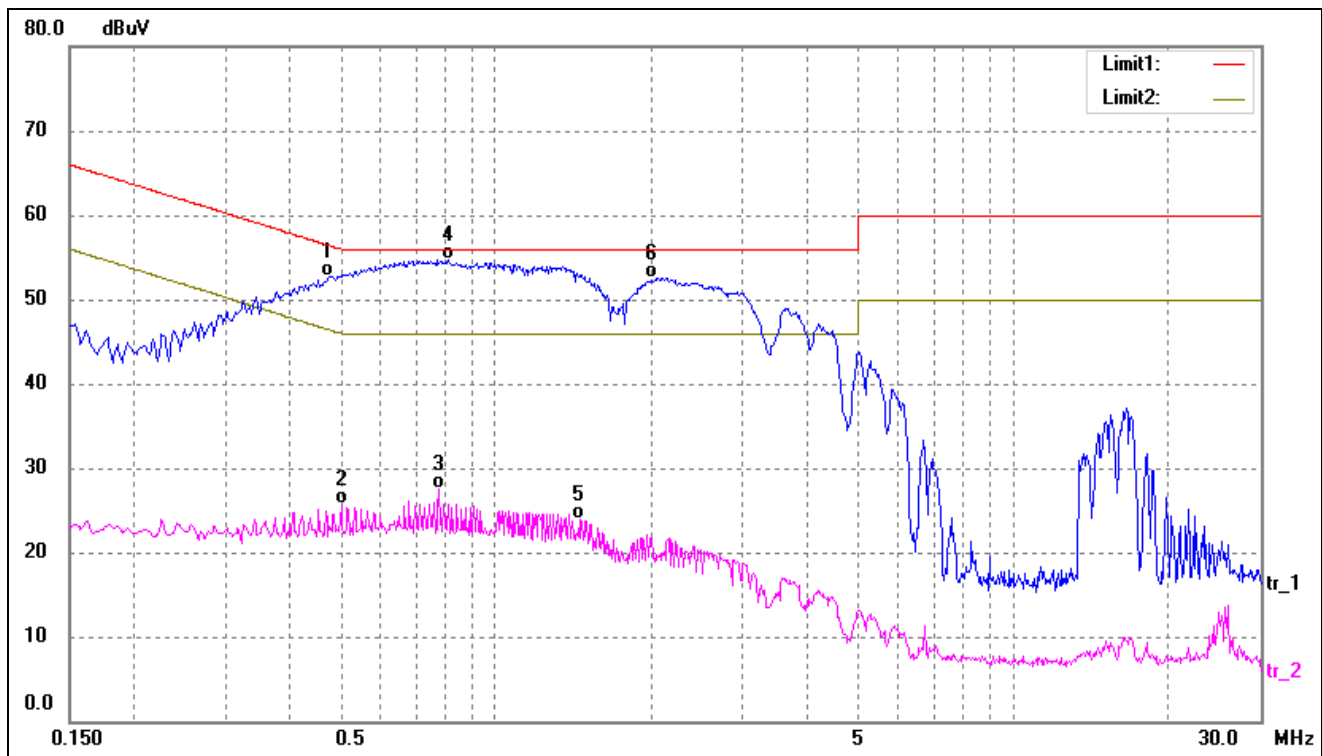
EUT: control box for light string

Tested Model: 8HSTR7-1801E2

Operating Condition: TM1

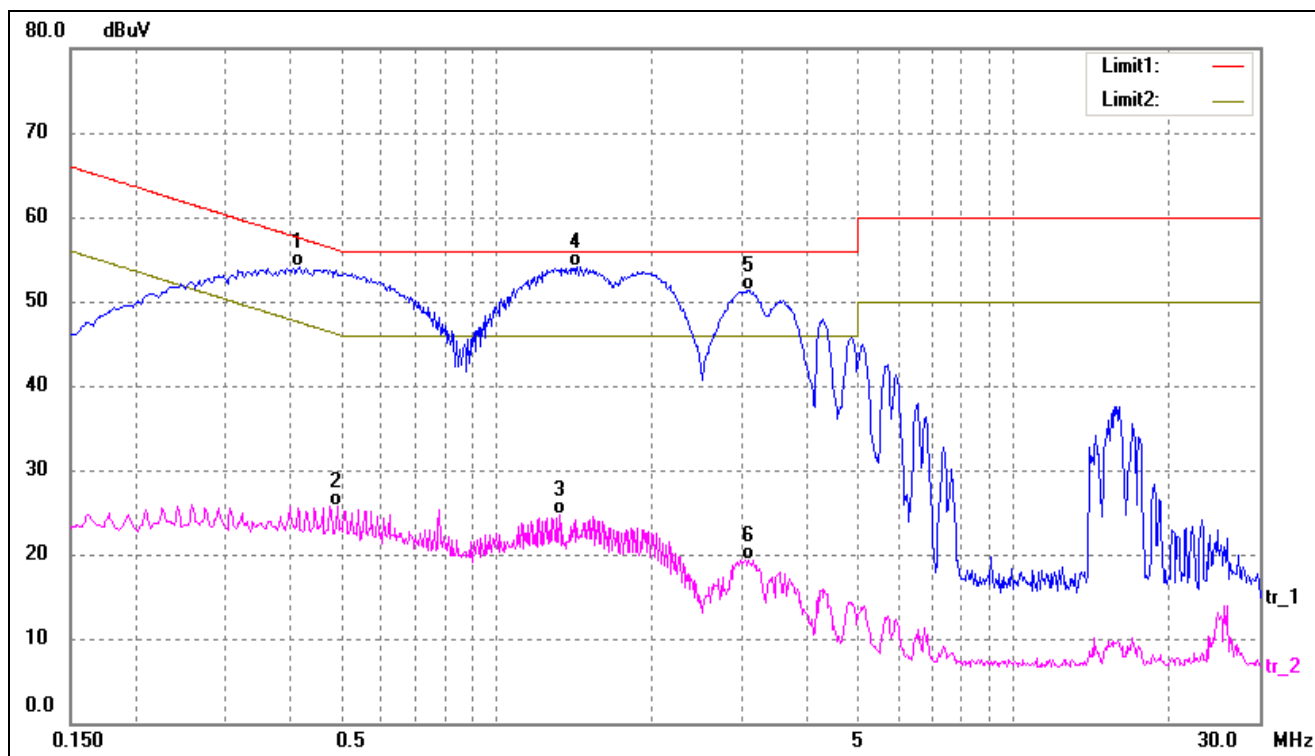
Comment: AC 120V/60Hz

Test Specification: Neutral



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.4780	42.84	9.80	52.64	56.37	-3.73	QP
2	0.5020	15.99	9.80	25.79	46.00	-20.21	AVG
3	0.7780	17.70	9.78	27.48	46.00	-18.52	AVG
4*	0.8100	44.85	9.78	54.63	56.00	-1.37	QP
5	1.4500	14.25	9.75	24.00	46.00	-22.00	AVG
6	2.0380	42.86	9.73	52.59	56.00	-3.41	QP

Test Specification: Line



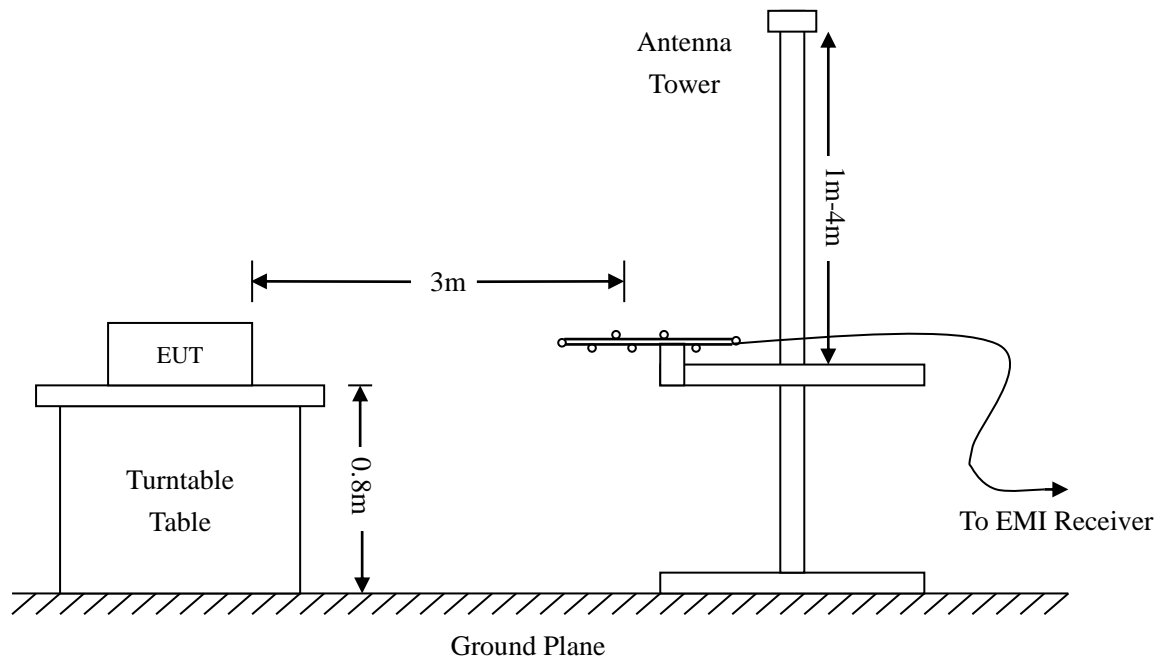
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.4180	44.26	9.80	54.06	57.49	-3.43	QP
2	0.4940	15.91	9.80	25.71	46.10	-20.39	AVG
3	1.3260	14.87	9.75	24.62	46.00	-21.38	AVG
4*	1.4380	44.35	9.75	54.10	56.00	-1.90	QP
5	3.0860	41.68	9.71	51.39	56.00	-4.61	QP
6	3.0860	9.57	9.71	19.28	46.00	-26.72	AVG

4. RADIATED EMISSION

4.1 Test Procedure

The setup of EUT is according with per ANSI C63.4-2014 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.



4.2 Test Receiver Setup

Frequency :9kHz-30MHz

RBW=10KHz,

VBW =30KHz

Sweep time= Auto

Trace = max hold

Detector function = peak

Frequency :30MHz-1GHz

RBW=120KHz,

VBW=300KHz

Sweep time= Auto

Trace = max hold

Detector function = peak, QP

Frequency :Above 1GHz

RBW=1MHz,

VBW=3MHz(Peak), 10Hz(AV)

Sweep time= Auto

Trace = max hold

Detector function = peak, AV



4.3 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 μ V means the emission is 6dB μ V below the maximum limit for a Class B device. The equation for margin calculation is as follows:

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

4.4 Environmental Conditions

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

4.5 Summary of Test Results/Plots

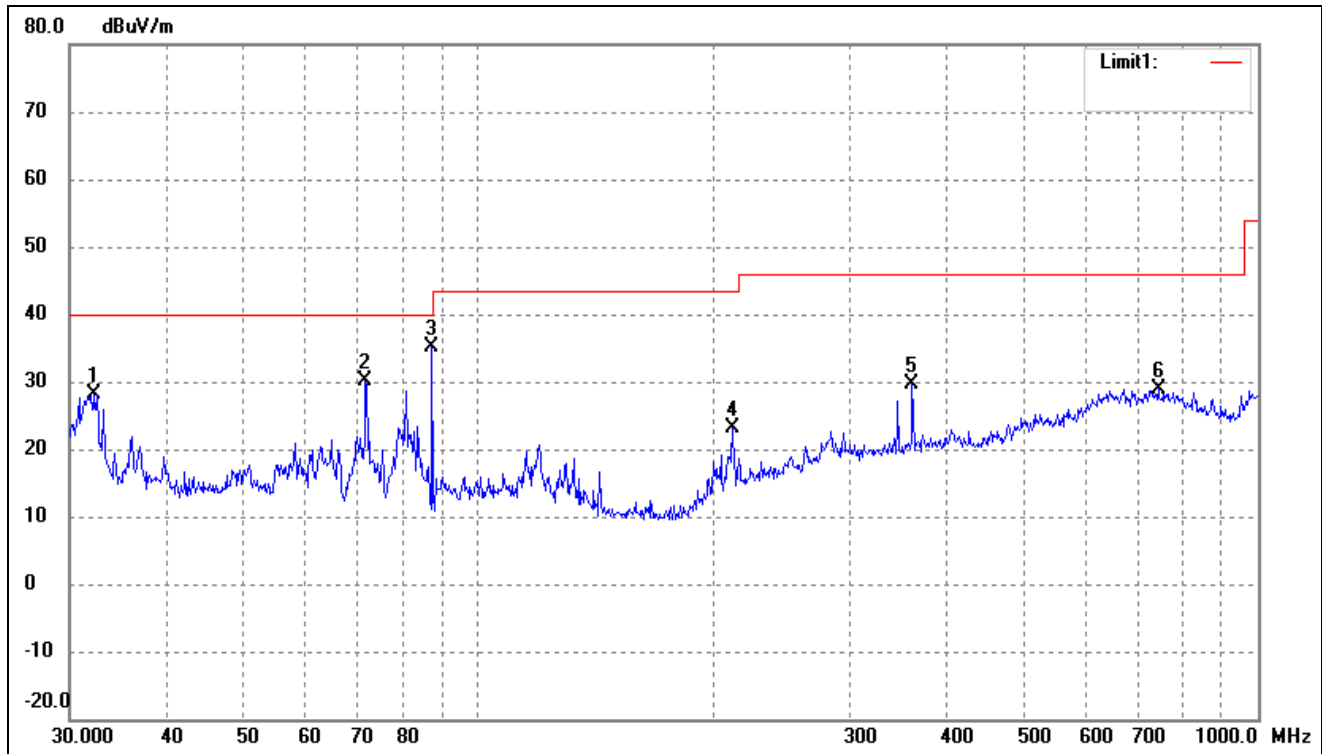
According to the data, the EUT complied with the FCC Part 15.109(a) rule, and had the worst margin of:

-4.83 dB at 87.4177 MHz in the Horizontal polarization, TM1 mode, 9 kHz to 1 GHz, 3Meters

Plot of Radiated Emissions Test Data

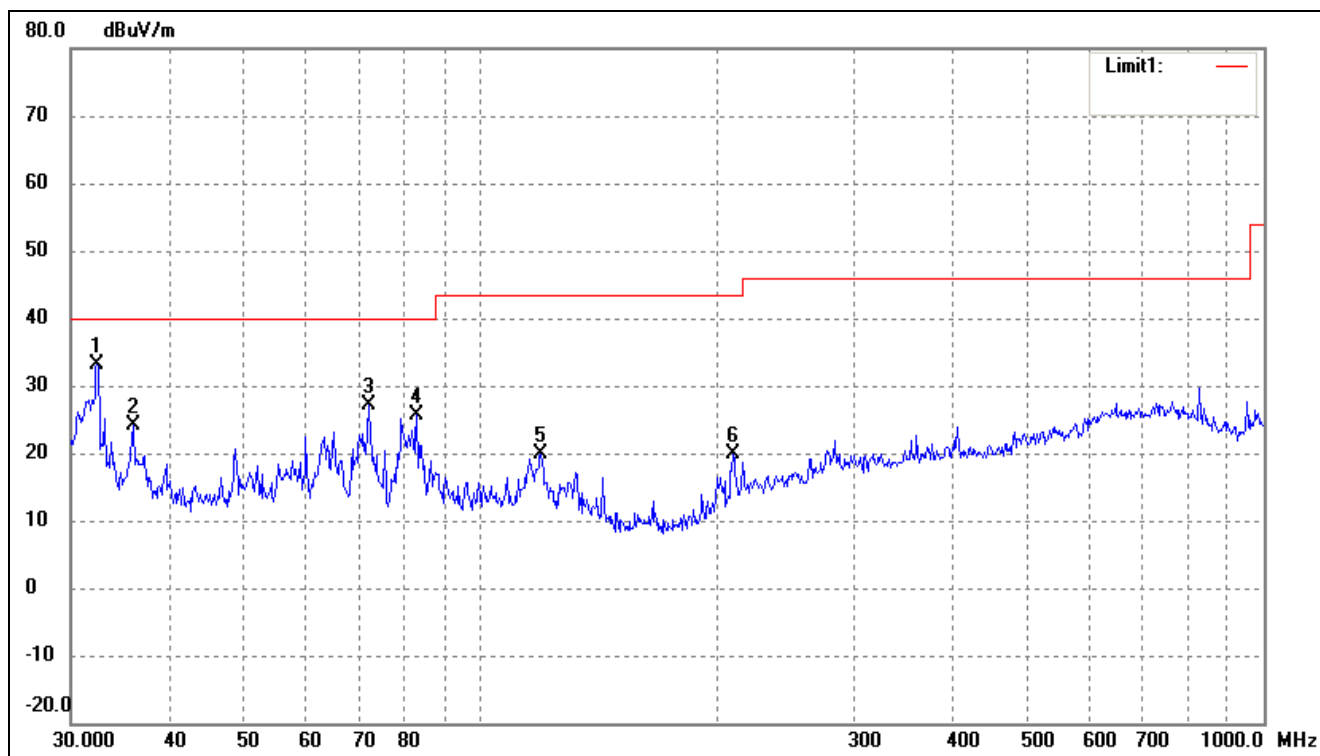
EUT: control box for light string
Tested Model: 8HSTR7-1801E2
Operating Condition: TM1
Comment: AC 120V/60Hz

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	32.1795	45.97	-17.80	28.17	40.00	-11.83	297	100	peak
2	71.8320	49.00	-18.94	30.06	40.00	-9.94	90	100	peak
3	87.4177	53.71	-18.54	35.17	40.00	-4.83	247	100	peak
4	212.2695	38.53	-15.52	23.01	43.50	-20.49	116	100	peak
5	360.4476	38.64	-8.92	29.72	46.00	-16.28	135	100	peak
6	744.8661	29.03	-0.03	29.00	46.00	-17.00	311	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	32.4059	51.01	-17.77	33.24	40.00	-6.76	324	100	peak
2	36.0007	41.19	-17.16	24.03	40.00	-15.97	93	100	peak
3	72.0843	46.07	-18.97	27.10	40.00	-12.90	167	100	peak
4	82.9385	44.99	-19.31	25.68	40.00	-14.32	99	100	peak
5	119.4361	36.48	-16.67	19.81	43.50	-23.69	166	100	peak
6	210.0482	35.92	-16.01	19.91	43.50	-23.59	284	100	peak

Emissions 1 - 5 GHz

During measurements from 1 GHz to 5 GHz, only base noise was detected.

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