

FCC Part 15B

Measurement and Test Report

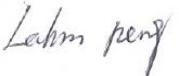
For

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-330C

| | |
|--------------------------------------|---|
| Test Standards: | <u>FCC Part 15 Subpart B</u> |
| Product Description: | <u>Curtain Controller</u> |
| Tested Model: | <u>LC-330C</u> |
| Report No.: | <u>STR12108166I</u> |
| Tested Date: | <u>2012-10-22 to 2012-12-24</u> |
| Issued Date: | <u>2013-01-16</u> |
| Tested By: | <u>Daniel Liu / Engineer</u>  |
| Reviewed By: | <u>Lahm Peng / EMC Manager</u>  |
| Approved & Authorized By: | <u>Jandy so / PSQ Manager</u>  |
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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 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.)

| General Description of EUT | |
|-----------------------------------|--------------------|
| Product Name: | Curtain Controller |
| Trade Name: | e-live |
| Model No.: | LC-330C |
| Adding Model(s): | / |

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

| Technical Characteristics of EUT | |
|---|------------------|
| Frequency Range: | 433.92 MHz (Rx) |
| Antenna Type: | Integral Antenna |
| Modulation: | ASK |
| Rated Voltage: | AC 100~240V |
| Rated Current: | 2A |
| Rated Power: | 480W |
| 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

| 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 ± 2.88 dB.

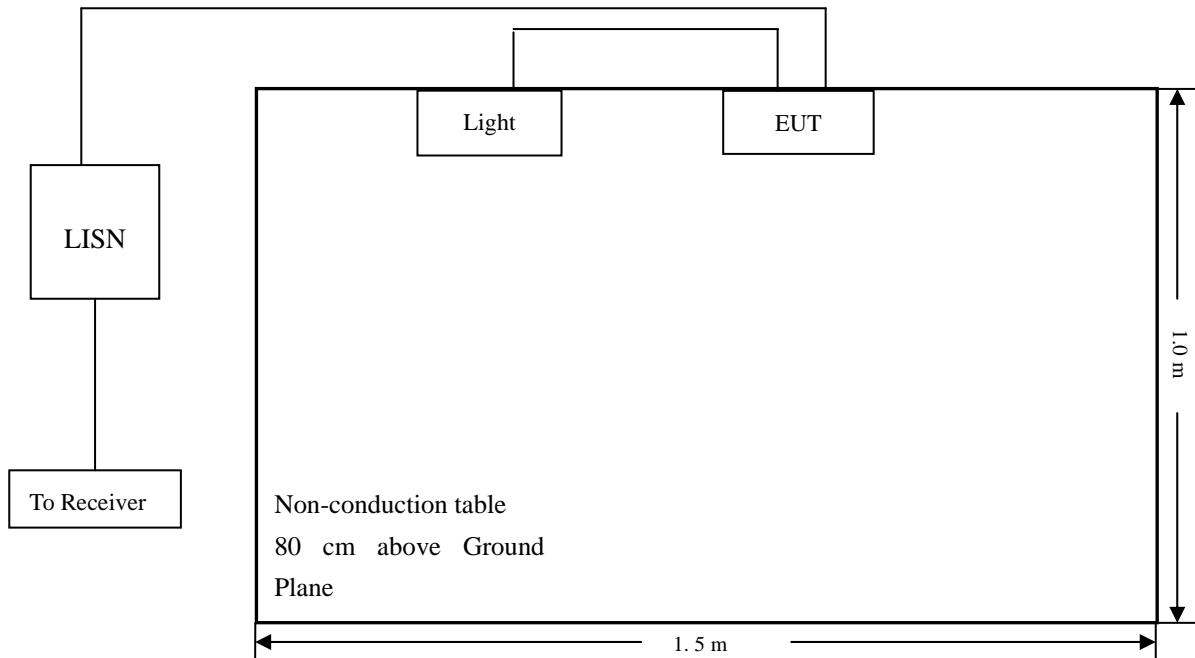
3.2 Test Equipment List and Details

| 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

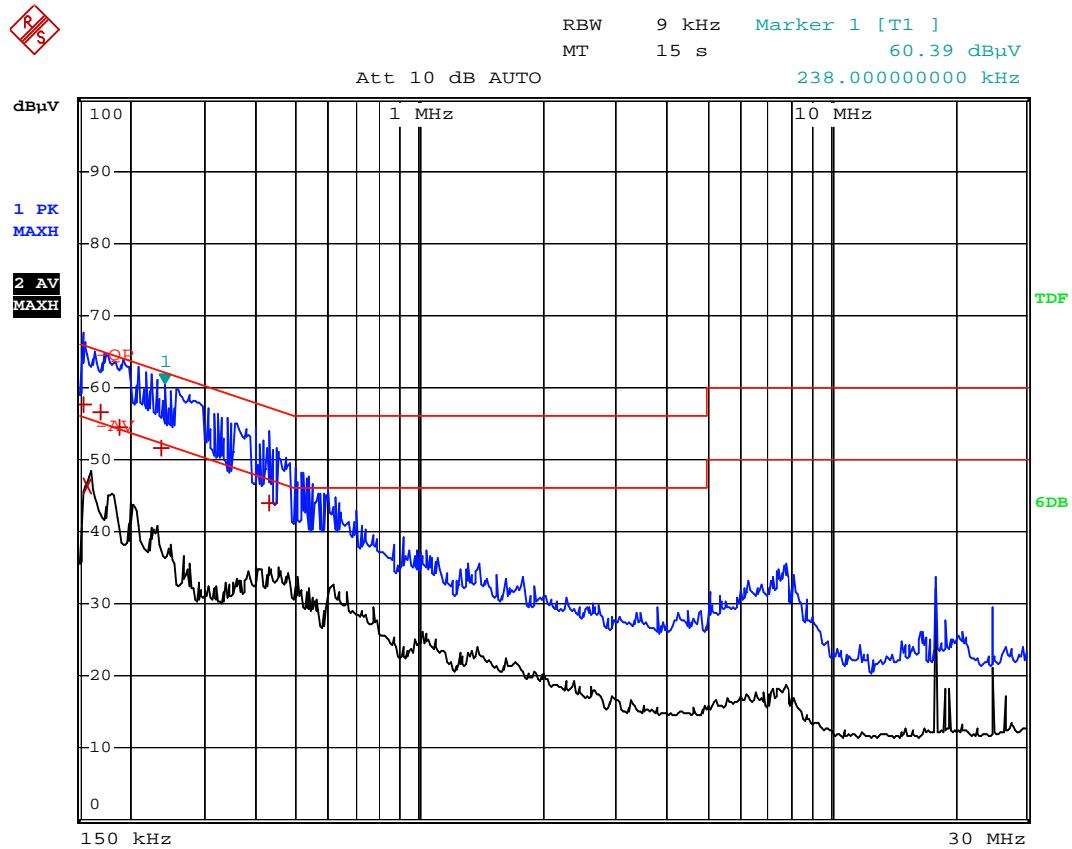
| | |
|--------------------|-----------|
| Temperature: | 23 °C |
| Relative Humidity: | 52% |
| ATM Pressure: | 1011 mbar |

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:

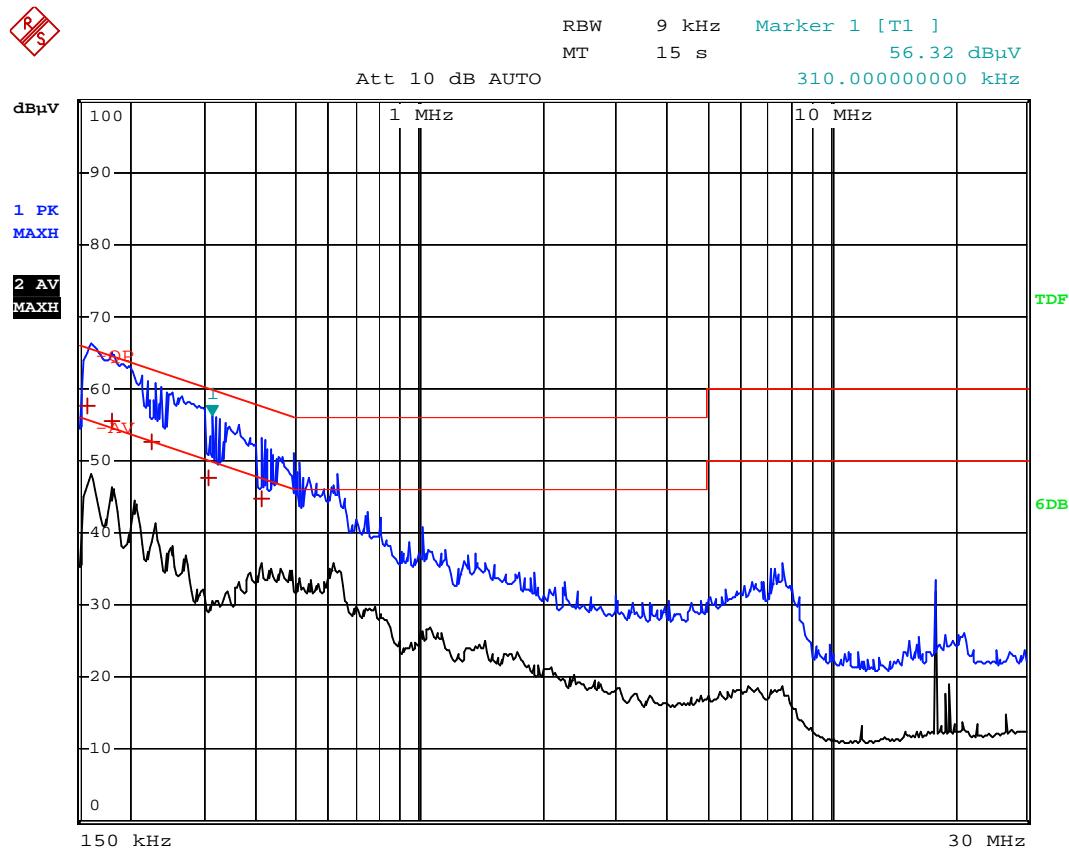
-7.98dB at 0.158 MHz in the Line, Quasi Peak detector, 0.15-30MHz

3.7 Conducted Emissions Test Data

Plot of Conducted Emissions Test DataEUT: *Curtain Controller*Tested Model: *LC-330C*Operating Condition: *Operating*Comment: *AC 120V/60Hz*Test Specification: *Neutral*

| EDIT PEAK LIST (Final Measurement Results) | | | | |
|--|-----------|------------|--------|----------|
| Trace1: | -QP | | | |
| Trace2: | -AV | | | |
| Trace3: | --- | | | |
| TRACE | FREQUENCY | LEVEL dBμV | DELTA | LIMIT dB |
| 1 Quasi Peak | 154 kHz | 57.48 | -8.29 | |
| 2 Average | 158 kHz | 46.28 | -9.28 | |
| 1 Quasi Peak | 170 kHz | 56.53 | -8.42 | |
| 1 Quasi Peak | 190 kHz | 54.42 | -9.61 | |
| 1 Quasi Peak | 238 kHz | 51.64 | -10.51 | |
| 1 Quasi Peak | 430 kHz | 43.94 | -13.30 | |

Test Specification: Line



| EDIT PEAK LIST (Final Measurement Results) | | | | |
|--|-----------|------------|-------|----------|
| Trace1: | -QP | | | |
| Trace2: | -AV | | | |
| Trace3: | --- | | | |
| TRACE | FREQUENCY | LEVEL dBµV | DELTA | LIMIT dB |
| 1 Quasi Peak | 158 kHz | 57.57 | | -7.98 |
| 1 Quasi Peak | 182 kHz | 55.57 | | -8.82 |
| 1 Quasi Peak | 226 kHz | 52.50 | | -10.08 |
| 1 Quasi Peak | 310 kHz | 47.53 | | -12.43 |
| 1 Quasi Peak | 410 kHz | 44.64 | | -13.00 |

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 ± 5.10 dB.

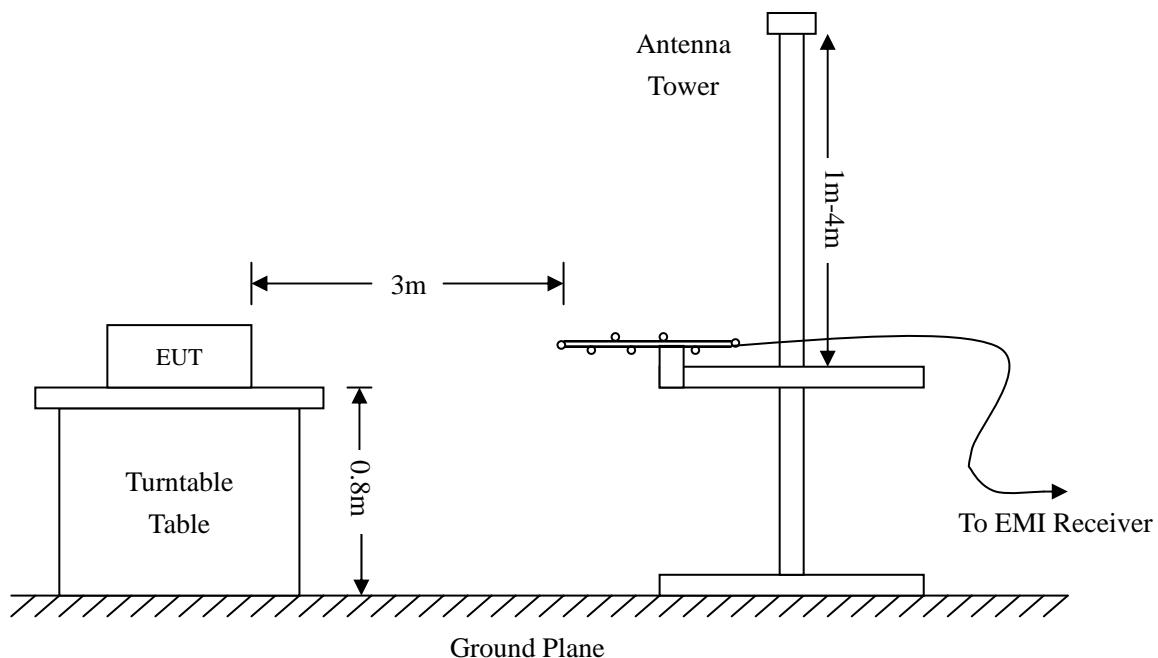
4.2 Test Equipment List and Details

| 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 |

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 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:

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

4.6 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:

-10.49 dB at 863.0562 MHz in the Horizontal polarization, 9 kHz to 5 GHz, 3Meters

Plot of Radiated Emissions Test Data

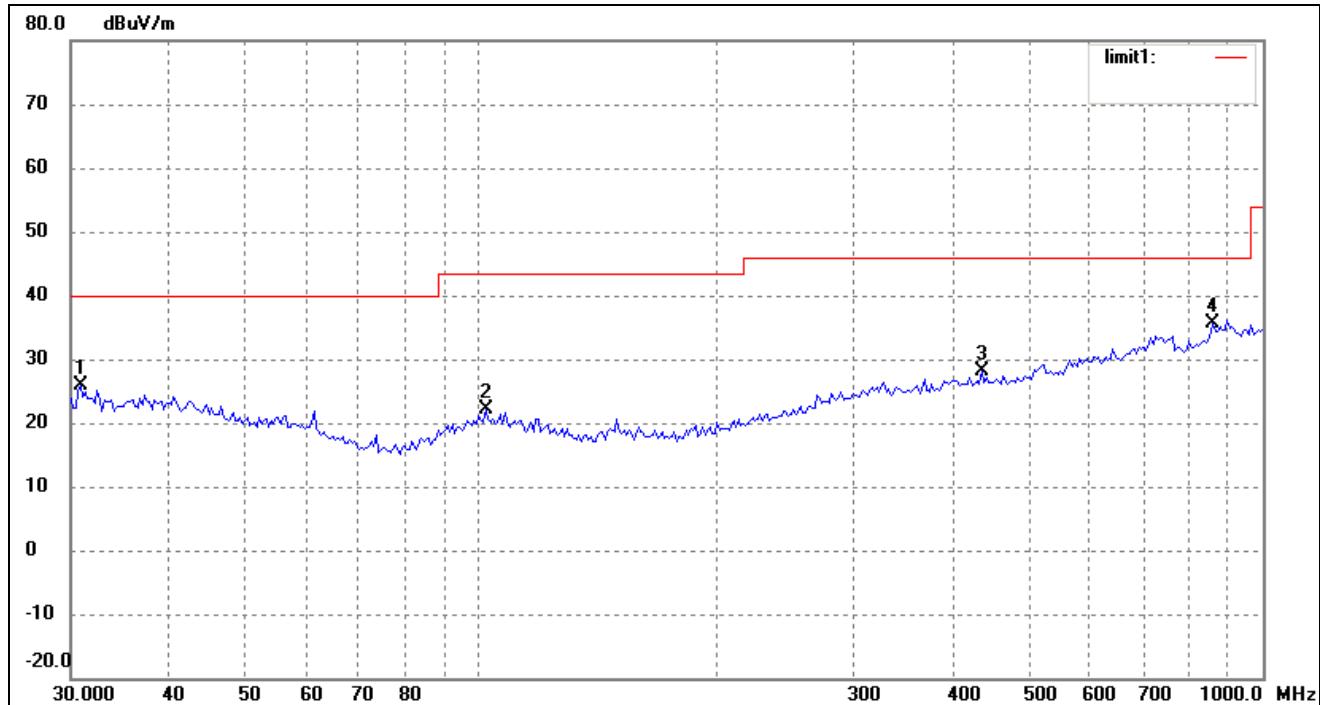
EUT: *Curtain Controller*

Tested Model: *LC-330C*

Operating Condition: *Operating*

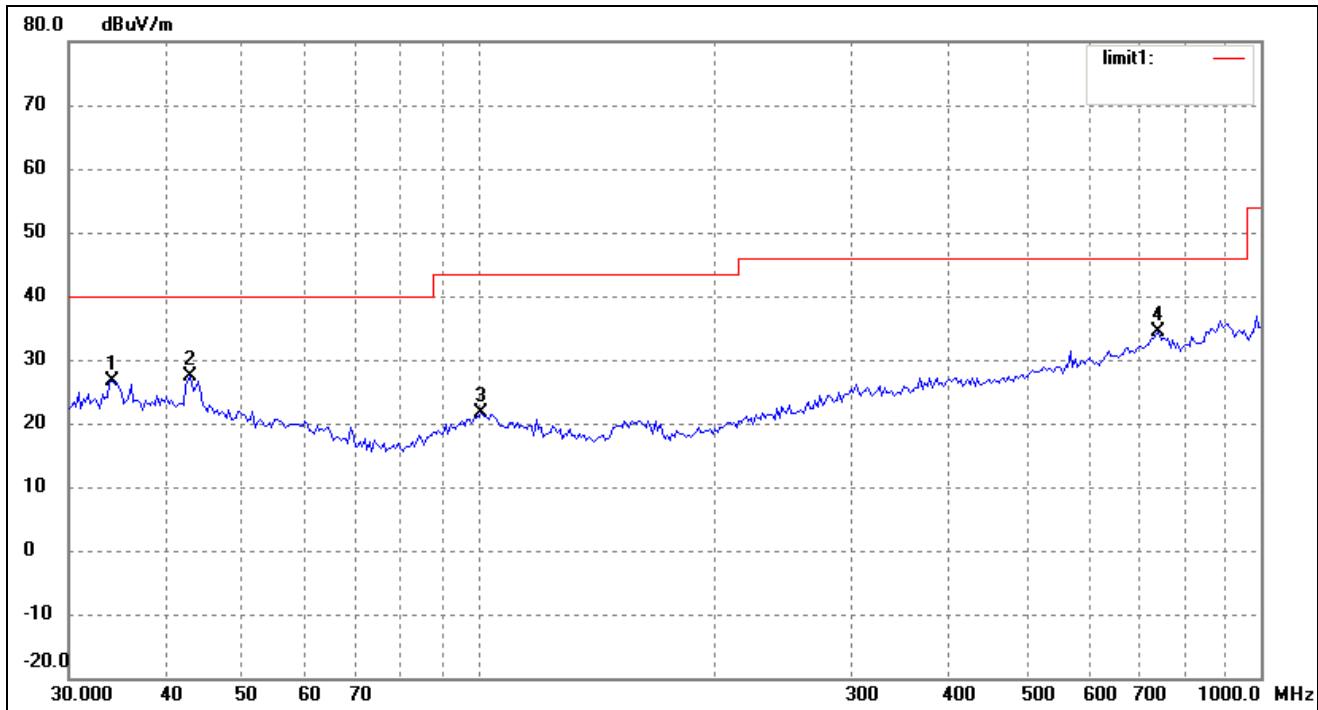
Comment: *AC 120V/60Hz*

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 | 30.8535 | 17.65 | 8.19 | 25.84 | 40.00 | -14.16 | 352 | 100 | peak |
| 2 | 101.6443 | 15.39 | 6.67 | 22.06 | 43.50 | -21.44 | 301 | 100 | peak |
| 3 | 437.1199 | 16.94 | 11.18 | 28.12 | 46.00 | -17.88 | 257 | 150 | peak |
| 4 | 863.0562 | 17.24 | 18.27 | 35.51 | 46.00 | -10.49 | 176 | 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 | 34.0365 | 17.98 | 8.72 | 26.70 | 40.00 | -13.30 | 346 | 100 | peak |
| 2 | 42.8998 | 18.53 | 8.79 | 27.32 | 40.00 | -12.68 | 311 | 100 | peak |
| 3 | 100.9340 | 14.77 | 6.75 | 21.52 | 43.50 | -21.98 | 258 | 100 | peak |
| 4 | 739.6605 | 16.41 | 18.07 | 34.48 | 46.00 | -11.52 | 173 | 100 | peak |

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 5th 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 *****