# STC Test Report

Date : 2011-06-16 
No. : HM166796

**Applicant (XLT001):** X 10 (USA) Inc.
620 Naches Ave SW, Building A, Renton, WA 98057,

**Manufacturer:** X-10 Electronics (Shenzhen) Co., Ltd.
Together Rich Industrial Park B, Sanwei Industrial District,
Xixiang Town, Baoan Country, Shengzhen, China

**Description of Sample(s):** Submitted sample(s) said to be

| | |
|---|---|
| Product: | 900MHz Wireless Audio/Video Sender |
| Brand Name: | X10 |
| Model Number: | VT50 |
| FCC ID: | B4SVT50 |

**Date Sample(s) Received:** 2011-04-12

**Date Tested:** 2011-04-19 to 2011-04-21

**Investigation Requested:** Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2010 and ANSI C63.4:2009 for FCC Certification.

**Conclusion(s):** The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

**Remark(s):** ---

Dr. LEE Kam Chuen
Authorized Signatory
ElectroMagnetic Compatibility Department
For and on behalf of
The Hong Kong Standards and Testing Centre Ltd.

**The Hong Kong Standards and Testing Centre Ltd.**
10 Dai Wang Street, Taipo Industrial Estate, N.T., Hong Kong
Tel: (852) 2666 1888 Fax: (852) 2664 4353 Homepage:www.hkstc.org E-mail: hkstc@hkstc.org

**CONTENT:**

## 1.0 General Details

### 1.1 Test Laboratory

The Hong Kong Standards and Testing Centre Ltd.
EMC Laboratory
10 Dai Wang Street, Taipo Industrial Estate
New Territories, Hong Kong

### 1.2 Applicant Details

**Applicant**

X 10 (USA) Inc.
620 Naches Ave SW, Building A, Renton, WA 98057,

**Manufacturer**

X-10 Electronics (Shenzhen) Co., Ltd.
Together Rich Industrial Park B, Sanwei Industrial District, Xixiang Town, Baoan Country, Shengzhen, China

**1.3 Equipment Under Test [EUT]**
**Description of Sample(s)**

| | |
|---|---|
| Product: | 900MHz Wireless Audio/Video Sender |
| Manufacturer: | X-10 Electronics (Shenzhen) Co., Ltd. |
| | Together Rich Industrial Park B, Sanwei Industrial District, Xixiang Town, Baoan Country, Shengzhen, China |
| Brand Name: | X10 |
| Model Number: | VT50 |
| Input Voltage: | 117Va.c. |

The AC/DC Adaptor used for the tests was provided by the applicant with the following details: Two pins (Live / Neutral) only adaptor, Model Number: SHG0720250PU, Input: 120Va.c. 60Hz 300mA, Output: 7.2Vd.c. 250mA

**1.3.1 Description of EUT Operation**

The Equipment Under Test (EUT) is an X-10 (USA) INC.; 900MHz Wireless Audio/Video Sender. Receive 433MHz signal and convert to IR signal to drive external IR LED for remote equipment control.

**1.4 Date of Order**

2011-04-12

**1.5 Submitted Sample(s):**

1 Sample

**1.6 Test Duration**

2011-04-19 to 2011-04-21

**1.7 Country of Origin**

China

## 2.0 Technical Details

### 2.1 Investigations Requested

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2010 Regulations and ANSI C63.4:2009 for FCC Certification.

### 2.2 Test Standards and Results Summary Tables

| EMISSION<br>Results Summary | | | | | |
|---|---|---|---|---|---|
| Test Condition | Test Requirement | Test Method | Class / Severity | Test Result | |
| | | | | Pass | Fail |
| Radiated Emissions | FCC 47CFR 15.109 | ANSI C63.4:2009 | N/A | ☒ | ☐ |
| Conducted Emissions on AC, 0.15MHz to 30MHz | FCC 47CFR 15.107 | ANSI C63.4:2009 | N/A | ☒ | ☐ |

Note: N/A - Not Applicable

## 3.0 Test Results

### 3.1 Emission

#### 3.1.1 Radiated Emissions

| | |
|---|---|
| Test Requirement: | FCC 47CFR 15.109 |
| Test Method: | ANSI C63.4:2009 |
| Test Date: | 2011-04-21 |
| Mode of Operation: | Receiver mode |

**Test Method:**

The sample was placed 0.8m above the ground plane on a standard radiated emission test site. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. In the frequency range of 9kHz to 30MHz, The center of the loop antenna shall be 1 meter above the ground and rotated loop axis for maximum reading. The emissions worst-case are shown in Test Results of the following pages.

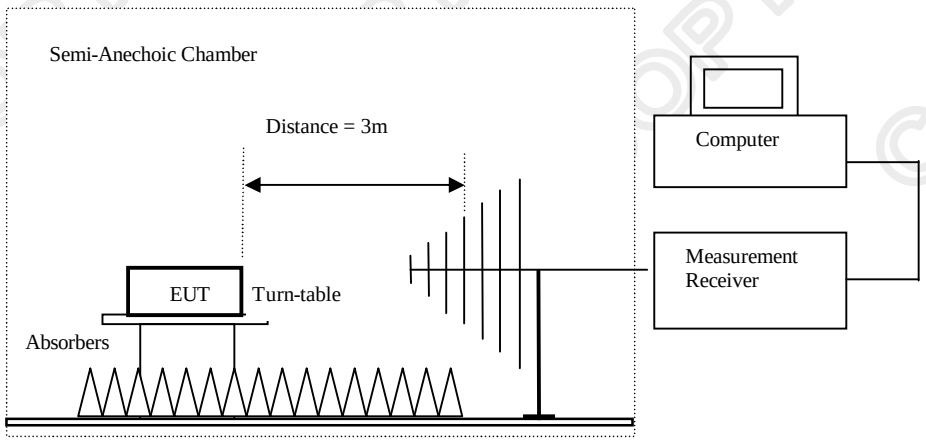
Remark: 3 orthogonal axis apply to hand-held device only.

*: Semi-anechoic chamber located on the G/F of The Hong Kong Standards and Testing Centre Ltd. with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 607756.

**Spectrum Analyzer Setting:**

| | | |
|---|---|---|
| 9KHz – 30MHz (Pk & Av) | RBW: | 10kHz |
| | VBW: | 30kHz |
| | Sweep: | Auto |
| | Span: | Fully capture the emissions being measured |
| | Trace: | Max. hold |
| 30MHz – 1GHz (QP) | RBW: | 120kHz |
| | VBW: | 120kHz |
| | Sweep: | Auto |
| | Span: | Fully capture the emissions being measured |
| | Trace: | Max. hold |
| Above 1GHz (Pk & Av) | RBW: | 3MHz |
| | VBW: | 3MHz |
| | Sweep: | Auto |
| | Span: | Fully capture the emissions being measured |
| | Trace: | Max. hold |

**Test Setup:**




Ground Plane

Absorbers placed on top of the ground plane are for measurements above 1000MHz only.

**Limits for Radiated Emissions [FCC 47 CFR 15.109]:**

| Frequency Range [MHz] | Field strength [microvolts/meter] | Measurement distance [meters] |
|---|---|---|
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above960 | 500 | 3 |

**Results of Rx on mode (30MHz – 1000MHz): PASS**

| **Field Strength of Fundamental Emissions Quasi-Peak Value** | | | | | | |
|---|---|---|---|---|---|---|
| Frequency MHz | Measured Level @3m dBμV/m | Correction Factor dBμV/m | Field Strength dBμV/m | Field Strength μV/m | Limit @3m μV/m | E-Field Polarity |
| 46.3 | 16.9 | 10.4 | 27.3 | 23.2 | 100 | Vertical |
| 92.7 | 6.1 | 9.0 | 15.1 | 5.7 | 100 | Vertical |
| 122.7 | 4.5 | 9.0 | 13.5 | 4.7 | 150 | Horizontal |
| 206.4 | 3.5 | 11.8 | 15.3 | 5.8 | 150 | Horizontal |
| 435.2 | 9.1 | 18.5 | 27.6 | 24.0 | 200 | Horizontal |
| 562.3 | 2.4 | 21.3 | 23.7 | 15.3 | 200 | Horizontal |

**Results of Rx on mode (Above 1000MHz): PASS**

| **Field Strength of Spurious Emissions Peak Value** | | | | | | |
|---|---|---|---|---|---|---|
| Frequency MHz | Measured Level dBμV | Correction Factor dB/m | Field Strength dBμV/m | Field Strength μV/m | Limit μV/m | E-Field Polarity |
| **Emissions detected are more than 20 dB below the FCC Limits** | | | | | | |

**Results of Rx on mode (Above 1000MHz): PASS**

| **Field Strength of Spurious Emissions Average Value** | | | | | | |
|---|---|---|---|---|---|---|
| Frequency MHz | Measured Level dBμV | Correction Factor dB/m | Field Strength dBμV/m | Field Strength μV/m | Limit μV/m | E-Field Polarity |
| **Emissions detected are more than 20 dB below the FCC Limits** | | | | | | |

Remarks:
Correction Factor includes Antenna Factor and Cable Attenuation.
Calculated measurement uncertainty : 30MHz to 1GHz 5.1dB

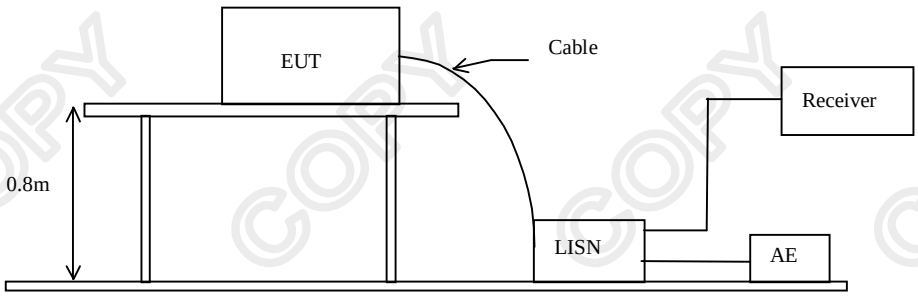
### 3.1.1 Conducted Emissions (0.15MHz to 30MHz)

| | |
|---|---|
| Test Requirement: | FCC 47CFR 15.107 |
| Test Method: | ANSI C63.4:2009 |
| Test Date: | 2011-04-19 |
| Mode of Operation: | Receiving mode |

**Test Method:**

The test was performed in accordance with ANSI C63.4: 2009, with the following: an initial measurement was performed in peak and average detection mode on the live line, any emissions recorded within 30dB of the relevant limit line were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

**Test Setup:**



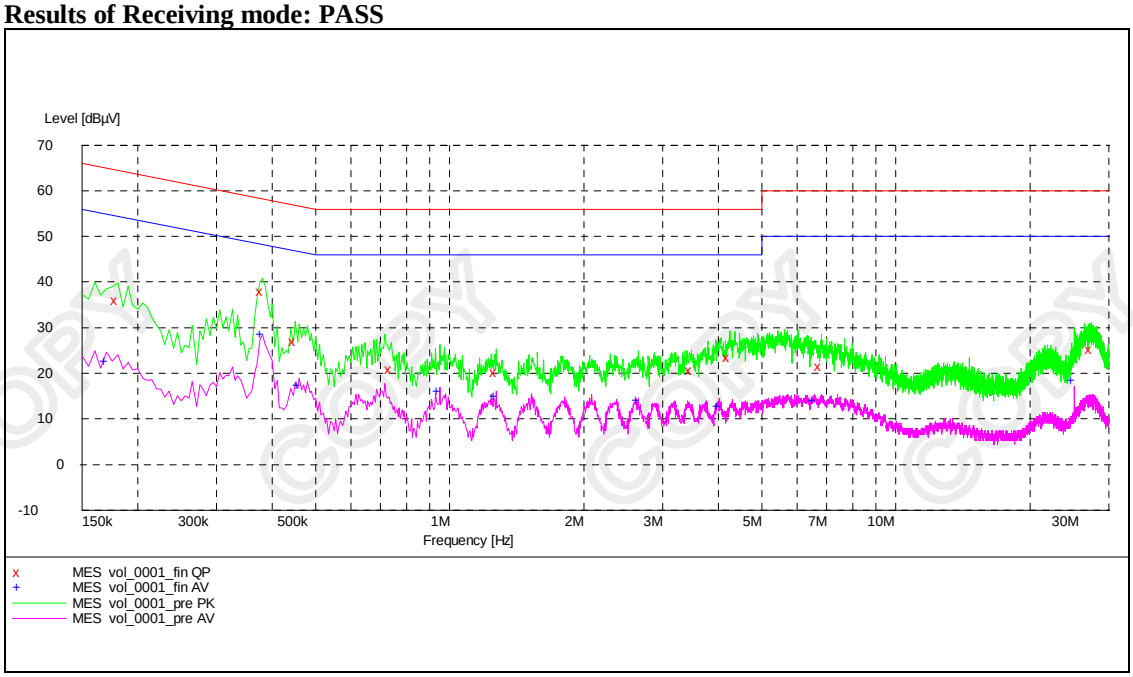
**Limit for Conducted Emissions (FCC 47 CFR 15.107):**

| Frequency Range [MHz] | Quasi-Peak Limits [dBµV] | Average [dBµV] |
|---|---|---|
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5.0 | 56 | 46 |
| 5.0-30.0 | 60 | 50 |

* Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram.

**Results of Receiving mode: PASS**



**Results of Receiving mode: PASS**

| Conductor Live or Neutral | Frequency MHz | Quasi-peak | | Average | |
|---|---|---|---|---|---|
| | | Level dBμV | Limit dBμV | Level μV | Limit μV |
| Live | 0.170 | -*- | -*- | 22.6 | 55.0 |
| Live | 0.180 | 36.1 | 65.0 | -*- | -*- |
| Live | 0.380 | 38.0 | 58.0 | 28.4 | 48.0 |
| Live | 0.450 | 27.0 | 57.0 | -*- | -*- |
| Live | 0.460 | -*- | -*- | 17.3 | 47.0 |
| Live | 0.950 | -*- | -*- | 15.9 | 46.0 |
| Live | 1.270 | 20.1 | 56.0 | 14.8 | 46.0 |
| Live | 2.645 | -*- | -*- | 14.0 | 46.0 |
| Live | 3.475 | 20.6 | 56.0 | -*- | -*- |
| Live | 4.015 | -*- | -*- | 12.7 | 46.0 |
| Live | 6.560 | -*- | -*- | 14.0 | 50.0 |
| Live | 6.795 | 21.6 | 60.0 | -*- | -*- |
| Neutral | 0.740 | 20.8 | 56.0 | -*- | -*- |
| Neutral | 4.240 | 23.3 | 56.0 | -*- | -*- |
| Neutral | 25.060 | -*- | -*- | 18.5 | 50.0 |
| Neutral | 27.415 | 25.2 | 60.0 | -*- | -*- |

Remarks:
Calculated measurement uncertainty : 3.97dB
-*- Emission(s) that is far below the corresponding limit line.

**Appendix A**

**List of Measurement Equipment**

**Radiated Emission**

| EQP NO. | DESCRIPTION | MANUFACTURER | MODEL NO. | SERIAL NO. | LAST CAL | DUE CAL |
|---|---|---|---|---|---|---|
| EM020 | HORN ANTENNA | EMCO | 3115 | 4032 | 2009/09/02 | 2011/09/02 |
| EM215 | MULTIDEVICE CONTROLLER | EMCO | 2090 | 00024676 | N/A | N/A |
| EM216 | MINI MAST SYSTEM | EMCO | 2075 | 00026842 | N/A | N/A |
| EM217 | ELECTRIC POWERED TURNTABLE | EMCO | 2088 | 00029144 | N/A | N/A |
| EM218 | ANECHOIC CHAMBER | ETS-Linggren | FACT-3 | -- | 2008/12/01 | 2011/12/01 |
| EM174 | BICONILOG ANTENNA | EMCO | 3142B | 1671 | 2010/02/09 | 2012/02/09 |
| EM229 | EMI Test Receiver | R&S | ESIB40 | 100248 | 2010/11/02 | 2011/11/02 |
| EM022 | LOOP ANTENNA | EMCO | 6502 | 1189-2424 | 2009/07/26 | 2011/07/26 |

**Line Conducted**

| EQP NO. | DESCRIPTION | MANUFACTURER | MODEL NO. | SERIAL NO. | LAST CAL | DUE CAL |
|---|---|---|---|---|---|---|
| EM197 | LISN | EMCO | 4825/2 | 1193 | 2010/10/13 | 2011/10/13 |
| EM181 | EMI TEST RECEIVER | ROHDE & SCHWARZ | ESIB7 | 100072 | 2010/07/01 | 2011/07/01 |
| EM154 | SHIELDING ROOM | SIEMENS MATSUSHITA COMPONENTS | N/A | 803-740-057-99A | 2011/01/23 | 2012/01/23 |

Remarks:-

CM Corrective Maintenance
N/A Not Applicable
TBD To Be Determined

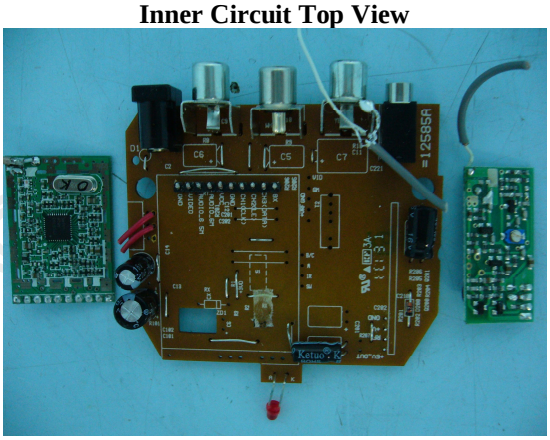
**Appendix B**

**Photographs of EUT**

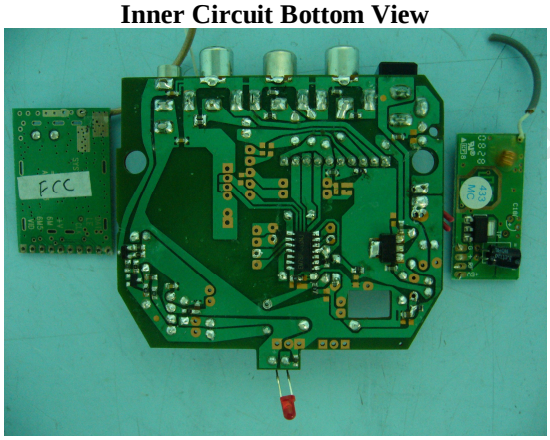
**Front View of the product**

**Rear View of the product**

**Inner Circuit Top View**

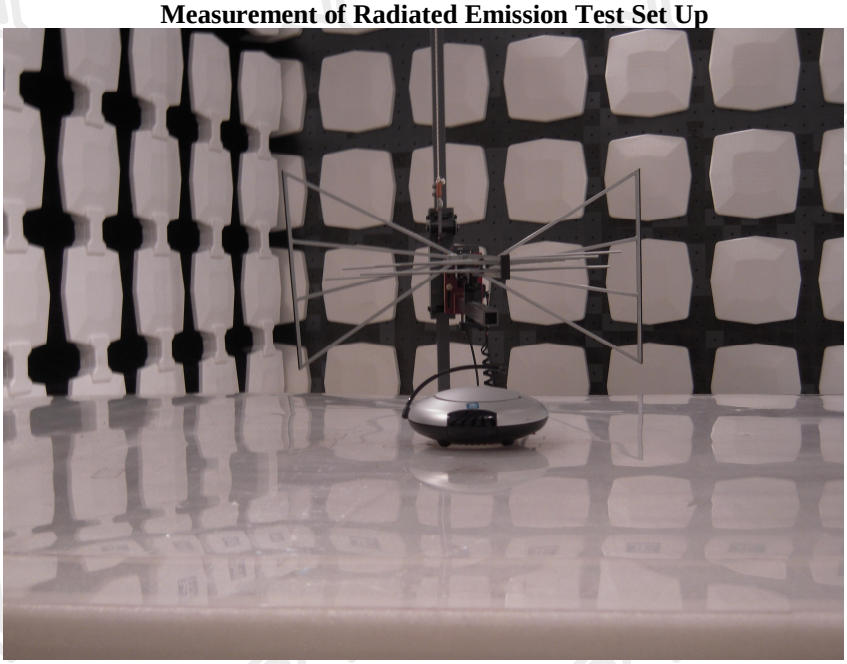


**Inner Circuit Bottom View**

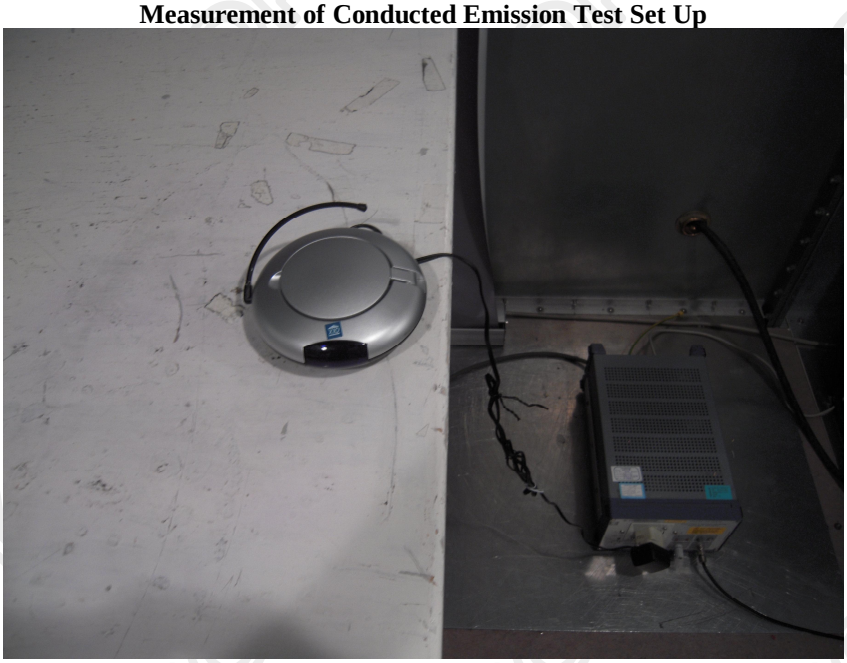


**Photographs of EUT**

**Measurement of Radiated Emission Test Set Up**



**Measurement of Conducted Emission Test Set Up**



******* End of Test Report *******