

Date : 2011-06-01 Page 1 of 20

No. : HM166612

**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: Professional Pan/Tilt/Zoom wireless

color camera

Brand Name: X10 Model Number: XC35A FCC ID: B4SXC35A

**Date Sample(s) Received:** 2011-04-26

**Date Tested:** 2011-05-16 to 2011-05-17

**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 <u>COMPLIED</u> 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.



Date : 2011-06-01 Page 2 of 20

No. : HM166612

Photographs

# **CONTENT:**

	Cover Content	Page 1 of 20 Page 2 of 20
<u>1.0</u>	General Details	
1.1	Test Laboratory	Page 3 of 20
1.2	Applicant Details Applicant Manufacturer	Page 3 of 20
1.3	Equipment Under Test [EUT] Description of EUT operation	Page 4 of 20
1.4	Date of Order	Page 4 of 20
1.5	Submitted Sample	Page 4 of 20
1.6	Test Duration	Page 4 of 20
1.7	Country of Origin	Page 4 of 20
<u>2.0</u>	Technical Details	
2.1	Investigations Requested	Page 5 of 20
2.2	Test Standards and Results Summary	Page 5 of 20
<u>3.0</u>	<u>Test Results</u>	
3.1	Radiated Emission	Page 6-16 of 20
	Appendix A	
	List of Measurement Equipment	Page 17 of 20
	Appendix B	

Page 18-20 of 20



Date: 2011-06-01 Page 3 of 20

No. : HM166612

# 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



Date : 2011-06-01 Page 4 of 20

No. : HM166612

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

Product: Professional Pan/Tilt/Zoom wireless color camera

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: XC35A 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: SHE1500500PU, Input: 100-

240Va.c. 50-60Hz 300mA, Output: 15Vd.c. 500mA

# 1.3.1 Description of EUT Operation

The Equipment Under Test (EUT) is an X-10 (USA) INC.; Professional Pan/Tilt/Zoom wireless color camera. XC35A is a 900MHz camera which converts video and audio to 900MHz RF signal.

### 1.4 Date of Order

2011-04-26

#### 1.5 Submitted Sample(s):

1 Sample

#### 1.6 Test Duration

2011-05-16 to 2011-05-17

# 1.7 Country of Origin

China



Date : 2011-06-01 Page 5 of 20

No. : HM166612

### 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 Results Summary								
Test Condition	Test Requirement	Test Method	Class /	Test I	Result			
			Severity	Pass	Fail			
Field Strength of Fundamental & Harmonics Emissions	FCC 47CFR 15.249	ANSI C63.4:2009	N/A					
Radiated Emissions	FCC 47CFR 15.209	ANSI C63.4:2009	N/A					
Conducted Emissions on AC, 0.15MHz to 30MHz	FCC 47CFR 15.207	ANSI C63.4:2009	N/A	$\boxtimes$				

Note: N/A - Not Applicable



Date : 2011-06-01 Page 6 of 20

No. : HM166612

3.0 Test Results

3.1 Emission

3.1.1 Radiated Emissions

Test Requirement: FCC 47CFR 15.249
Test Method: ANSI C63.4:2009
Test Date: 2011-05-16
Mode of Operation: Tx mode

#### **Test Method:**

The sample was placed 0.8m above the ground plane of semi-anechoic Chamber\*. 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. 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.



Date : 2011-06-01 Page 7 of 20

No. : HM166612

## **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

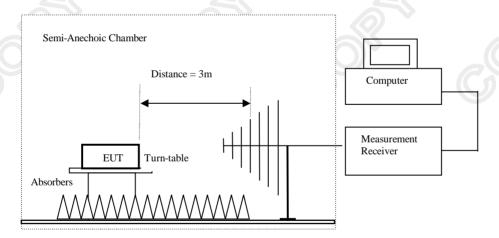
Above 1GHz (Pk & Av) RBW: 3MHz

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.



Date : 2011-06-01 Page 8 of 20

No. : HM166612

# Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

Frequency Range of Fundamental	Field Strength of Fundamental Emission	Field Strength of Harmonics Emission		
[MHz]	[microvolts/meter]	[microvolts/meter]		
902-928	50,000 [Average]	500 [Average]		
2400-2483.5	50,000 [Average]	500 [Average]		

#### Results of Tx mode: Pass

Field Strength of Fundamental Emissions Qusai-Peak Value							
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field	
	Level @3m	Factor	Strength	Strength		Polarity	
MHz	dBμV/m	dBμV/m	dBμV/m	μV/m	μV/m		
921	73.2	18.5	91.7	38,459.2	50,000	Vertical	

Field Strength of Fundamental Emissions									
4	Peak Value								
Frequency	Measured	Correction	Field	Field	Limit @3m	E-Field			
	Level @3m	Factor	Strength	Strength	>	Polarity			
MHz	dBμV/m	dBμV/m	dBμV/m	μV/m	μV/m				
1842.5	11.2	26.1	37.3	73.3	5,000	Vertical			
* 2763.0					5,000	Horizontal			
* 3684.0					5,000	Horizontal			
* 4605.0					5,000	Horizontal			
5526.0					5,000	Horizontal			
6447.0		No Emissio	on Detected		5,000	Horizontal			
* 7368.0					5,000	Horizontal			
* 8289.0					5,000	Horizontal			
* 9210.0					5,000	Horizontal			

### Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB 1GHz to 18GHz 5.1dB

<sup>\*:</sup> Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of ECC Rules Part 15 Section 15 205 and the limits of ECC Rules Part 15 Section 15 209



Date : 2011-06-01 Page 9 of 20

No. : HM166612

# Limits for Field Strength of Fundamental & Harmonics Emissions [FCC 47CFR 15.249]:

Frequency Range of Fundamental	Field Strength of Fundamental Emission	Field Strength of Harmonics Emission		
[MHz]	[microvolts/meter]	[microvolts/meter]		
902-928	50,000 [Average]	500 [Average]		
2400-2483.5	50,000 [Average]	500 [Average]		

#### Results of Tx mode: Pass

Field Strength of Fundamental Emissions									
Frequency	Average Value  Frequency Measured Correction Field Field Limit @3m E-Field								
	Level @3m	Factor	Strength	Strength		Polarity			
MHz	dBμV/m	dBμV/m	dBμV/m	μV/m	μV/m				
1842.5	6.2	26.1	32.3	41.2	500	Vertical			
* 2763.0					500	Vertical			
* 3684.0					500	Vertical			
* 4605.0					500	Vertical /			
5526.0					500	Vertical			
6447.0		No Emissio	500	Vertical					
* 7368.0					500	Vertical			
* 8289.0					500	Vertical			
* 9210.0					500	Vertical			

### Remarks:

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Calculated measurement uncertainty : 30MHz to 1GHz 5.2dB

1GHz to 18GHz 5.1dB



<sup>\*:</sup> Denotes restricted band of operation.

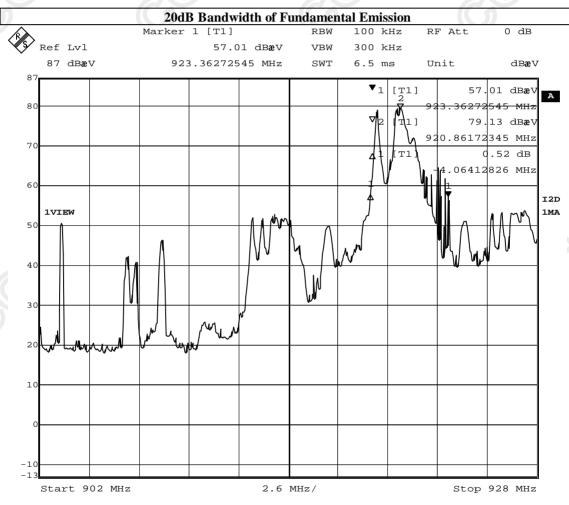


Date: 2011-06-01 Page 10 of 20

No. : HM166612

#### Limits for 20dB Bandwidth of Fundamental Emission:

Frequency Range	20dB Bandwidth
[MHz]	[MHz]
921	4.06

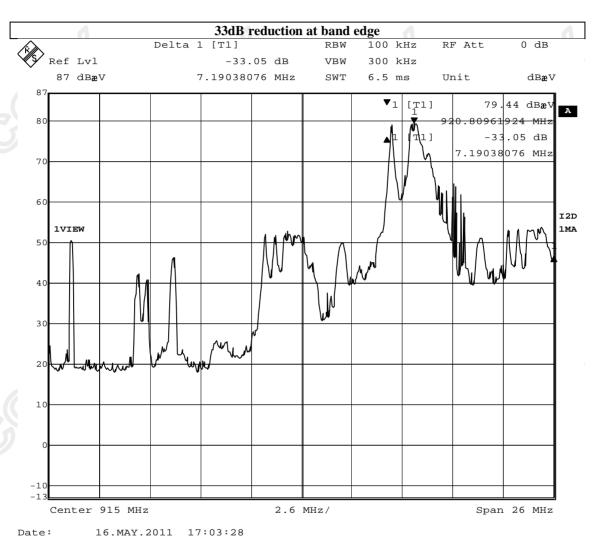


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Date: 2011-06-01 Page 11 of 20

No. : HM166612



# The Hong Kong Standards and Testing Centre Ltd.



Date : 2011-06-01 Page 12 of 20

No. : HM166612

#### Limits for Radiated Emissions [FCC 47 CFR 15.209]:

Limits for Radiated Limssions [	Emilia for Rudiuced Emiliations [1 CC 47 CTR 12.207].									
Frequency Range	Field strength	Measurement distance								
[MHz]	[microvolts/meter]	[meters]								
0.009-0.490	2400/F(kHz)	300								
0.490-1.705	24000/F(kHz)	30								
1.705-30	30	30								
30-88	100	3								
88-216	150	((3))								
216-960	200	3								
Above960	500	3								

The emission limits shown in the above table are based on measurement employing a CISPR quasipeak detector and above 1000MHz are based on measurements employing an average detector.

## Results of Tx on mode (9k - 30MHz): PASS

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

# Results of Tx on mode (30MHz - 1000MHz): PASS

Field Strength of Spurious Emissions							
Quasi-Peak Value							
Frequency	Measured	Correction	Field	Field	Limit	E-Field	
	Level	Factor	Strength	Strength		Polarity	
MHz	dΒμV	dB/m	$dB\mu V/m$	$\mu V/m$	$\mu V/m$		
928.10	14.0	25.7	39.7	96.6	200.0	Vertical	



Date: 2011-06-01 Page 13 of 20

No. : HM166612

# Results of Tx on mode (Above 1000MHz): PASS

	Field Strength of Spurious Emissions							
	Peak Value							
Frequency	Measured	Correction	Field	Field	Limit	E-Field		
	Level	Factor	Strength	Strength		Polarity		
MHz	dΒμV	dB/m	$dB\mu V/m$	$\mu V/m$	$\mu V/m$	1)		
	Emissions detected are more than 20 dB below the FCC Limits							

### Results of Tx on mode (Above 1000MHz): PASS

Field Strength of Spurious Emissions						
Average Value						
Frequency	Measured	Correction	Field	Field	Limit	E-Field
	Level	Factor	Strength	Strength		Polarity
MHz	dΒμV	dB/m	dBμV/m	$\mu V/m$	$\mu V/m$	
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



Date: 2011-06-01 Page 14 of 20

No. : HM166612

# 3.1.2 Conducted Emissions (0.15MHz to 30MHz)

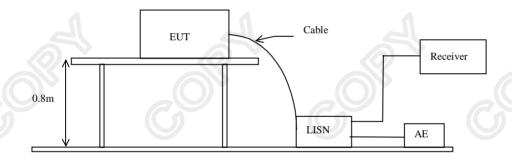
Test Requirement: FCC 47CFR 15.207
Test Method: ANSI C63.4:2009
Test Date: 2011-05-17

Mode of Operation: Transmitting 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:**





Date : 2011-06-01 Page 15 of 20

No. : HM166612

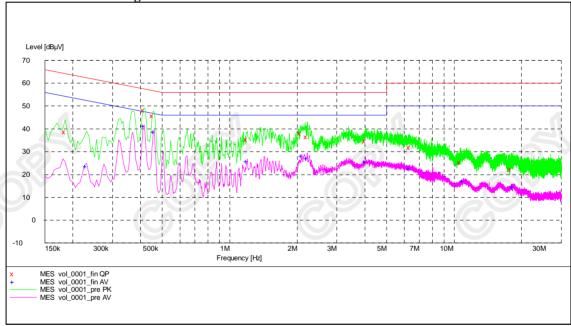
# Limit for Conducted Emissions (FCC 47 CFR 15.207):

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

<sup>\*</sup> 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 Transmitting mode: PASS** 





Date : 2011-06-01 Page 16 of 20

No. : HM166612

# **Results of Transmitting mode: PASS**

	Frequency MHz	Qua	si-peak	Average		
Conductor Live or Neutral		Level dBµV	Limit dBµV	Level μV	Limit µV	
Live	0.415	_*_	_*_	41.2	48.0	
Live	0.455	45.8	57.0	_*_	_*_	
Live	0.460	_*_	_*_	38.6	47.0	
Live	1.195	35.4	56.0	25.9	46.0	
Live	2.095	_*_	_*_	28.0	46.0	
Live	2.210	36.5	56.0	_*_	_*_	
Live	4.035	34.6	56.0	25.4	46.0	
Live	6.315	_*_	_*_	22.7	50.0	
Live	6.340	31.9	60.0	_*_	_*_	
Live	18.300	_*_	_*_	14.5	50.0	
Neutral	0.185	38.6	64.0	_*_	_*_	
Neutral	0.230			23.5	52.0	
Neutral	0.415	48.0	58.0	_*_	_*_	
Neutral	2.070	37.9	56.0	_*_	_*_	
Neutral	2.210	2	6	27.1	46.0	
Neutral	10.700	25.3	60.0	_*_	_*_	
Neutral	10.980			17.2	50.0	
Neutral	17.960	22.2	60.0	_*_	_*_	
Neutral	18.300	_*_	_*_	14.5	50.0	

### Remarks:

Calculated measurement uncertainty: 3.97dB

-\*- Emission(s) that is far below the corresponding limit line.



Date: 2011-06-01 Page 17 of 20

No. : HM166612

# 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:-

Corrective Maintenance CM

N/A Not Applicable TBD To Be Determined



Date : 2011-06-01 Page 18 of 20

No. : HM166612

# Appendix B

# Photographs of EUT

Front View of the product



Left View of the product



**Top View of the product** 



Rear View of the product



Right View of the product



**Bottom View of the product** 

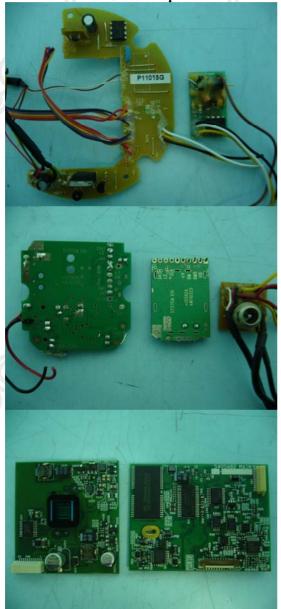


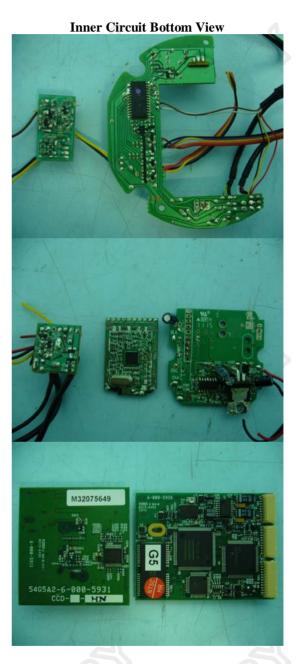


Date : 2011-06-01 Page 19 of 20

No. : HM166612

**Inner Circuit Top View** 





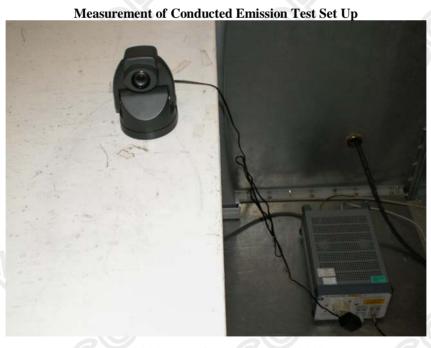


Date: 2011-06-01 Page 20 of 20

No. : HM166612

# Photographs of EUT

**Measurement of Radiated Emission Test Set Up** 



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