



FCC PART 15, CLASS B  
MEASUREMENT AND TEST REPORT

For

**Shenzhen Foscam Intelligent Technology Co., Ltd.**

5/F, Block 1, Vision Business Park, Nanshan District, Shenzhen, PRC

**FCC ID: ZDEFI9826PV2**

<b>Report Type:</b> Original Report	<b>Product Name:</b> Wireless IP Camera
<b>Test Engineer:</b> Joson Xiao	<i>Joson Xiao</i>
<b>Report Number:</b> RSZ140731012-00A	
<b>Report Date:</b> 2014-09-02	
<b>Reviewed By:</b> Dick Zhang EMC Leader	<i>Dick Zhang</i>
<b>Prepared By:</b> Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 <a href="http://www.baclcorp.com.cn">www.baclcorp.com.cn</a>	

**Note:** This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp.

## TABLE OF CONTENTS

<b>GENERAL INFORMATION</b> .....	<b>3</b>
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	3
OBJECTIVE.....	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST METHODOLOGY.....	3
TEST FACILITY.....	4
<b>SYSTEM TEST CONFIGURATION (FCC §15.27)</b> .....	<b>5</b>
JUSTIFICATION.....	5
EUT EXERCISE SOFTWARE.....	5
SPECIAL ACCESSORIES.....	5
EQUIPMENT MODIFICATIONS.....	5
SUPPORT EQUIPMENT LIST AND DETAILS.....	5
EXTERNAL I/O CABLE.....	5
BLOCK DIAGRAM OF TEST SETUP.....	6
<b>SUMMARY OF TEST RESULTS</b> .....	<b>7</b>
<b>FCC §15.107 – AC LINE CONDUCTED EMISSIONS</b> .....	<b>8</b>
APPLICABLE STANDARD.....	8
MEASUREMENT UNCERTAINTY.....	8
EUT SETUP.....	8
EMI TEST RECEIVER SETUP.....	9
TEST PROCEDURE.....	9
TEST EQUIPMENT LIST AND DETAILS.....	9
CORRECTED FACTOR & MARGIN CALCULATION.....	9
TEST RESULTS SUMMARY.....	10
TEST DATA.....	10
<b>FCC §15.109 - RADIATED SPURIOUS EMISSIONS</b> .....	<b>13</b>
APPLICABLE STANDARD.....	13
MEASUREMENT UNCERTAINTY.....	13
EUT SETUP.....	13
EMI TEST RECEIVER SETUP.....	14
TEST PROCEDURE.....	14
TEST EQUIPMENT LIST AND DETAILS.....	14
CORRECTED AMPLITUDE & MARGIN CALCULATION.....	15
TEST RESULTS SUMMARY.....	15
TEST DATA.....	15
<b>PRODUCT SIMILARITY DECLARATION LETTER</b> .....	<b>18</b>

## GENERAL INFORMATION

---

### Product Description for Equipment under Test (EUT)

The *ShenZhen Foscam Intelligent Technology Co., Ltd.*'s product, model number: *FI9826P V2* (FCC ID: *ZDEFI9826PV2*) or the "EUT" in this report was a *Wireless IP Camera*, which was measured approximately: 117 mm (L) x 104 mm (W) x 121 mm (H), rated with input voltage: DC 5.0 V from adapter.

Adapter information:

Model: SAW-0502000

Input: AC 100-240V, 50/60 Hz, 0.5A

Output: DC 5.0V, 2000mA

*Note: The product, series model FI9826P V2, HD818P V2, EH8155 V2, FI9826W V2, FC2503WZ V2, FC2503PZ V2 are electrically identical, the only difference among them is their model numbers. Model FI9826P V2 was selected for fully testing, the detailed information can be referred to the attached declaration letter that stated and guaranteed by the applicant.*

*\*All measurement and test data in this report was gathered from production sample serial number: 1407230 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2014-07-31.*

### Objective

This report is prepared on behalf of *Shenzhen Foscam Intelligent 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 of the manufacturer is to determine the compliance of EUT with FCC PART 15, CLASS B.

### Related Submittal(s)/Grant(s)

FCC part 15.247 DTS submission with FCC ID: ZDEFI9826PV2

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2009, 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.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

## **Test Facility**

The test site used by Bay Area Compliance Laboratories Corp.(Shenzhen) to collect test data is located on the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone Shenzhen, Guangdong, China.

Test site at Bay Area Compliance Laboratories Corp. (Shenzhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on December 06, 2010. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2009.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

## SYSTEM TEST CONFIGURATION (FCC §15.27)

### Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

### EUT Exercise Software

No exercise software was used.

### Special Accessories

No special accessory was used.

### Equipment Modifications

No modification was made to the EUT tested.

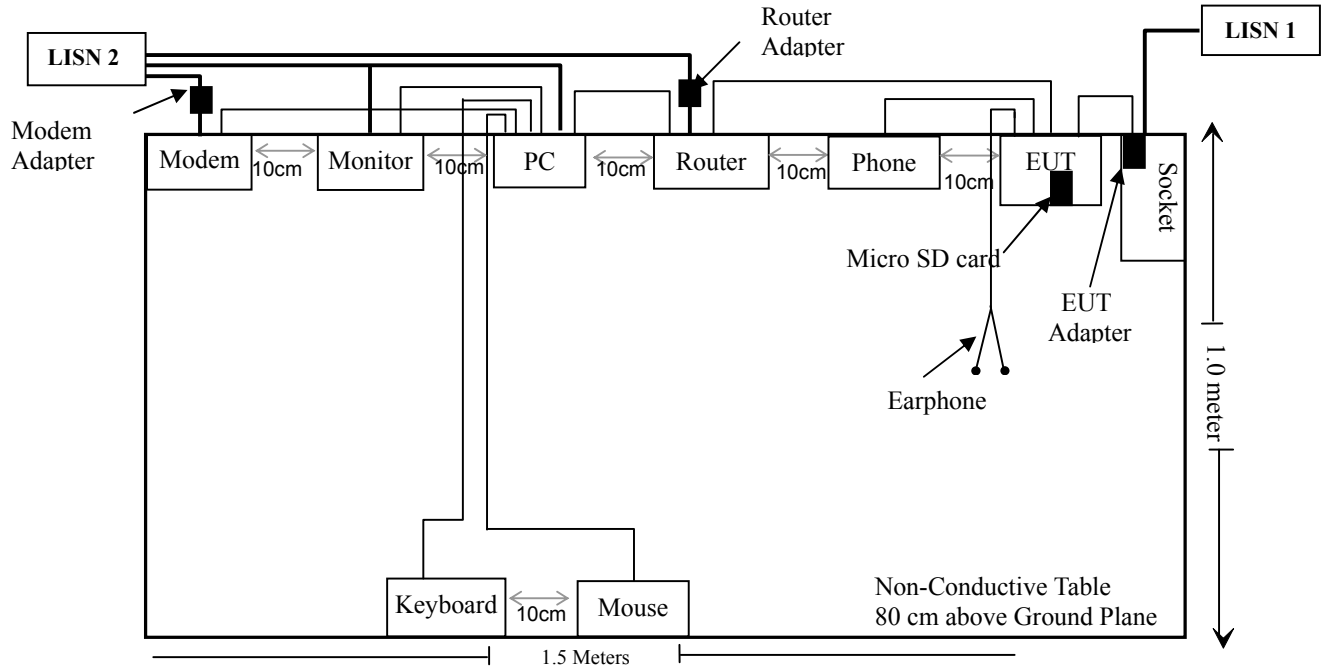
### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	PC	VOSTRO 220S	127BP2X
DELL	Monitor	E178WFPC	CN-OWY564-64180-7C4-2SQH
DELL	Keyboard	L100	CNORH656658907BL05DC
DELL	Mouse	MOC5UO	G1900NKD
SAST	Modem	AEM-2100	0293
Sandisk	T-F Card	N/A	3491
HTC	Phone	G18	HT247V805779
TB-LINK	Wireless Router	TL-WR847N	13203838617

### External I/O Cable

Cable Description	Length (m)	From/Port	To
Un-shielding Un-detachabled DC Cable	1.37	Adapter	EUT
Un- shielding Detachabled audio Cable	0.5	Phone	EUT
Un-shielding Un-detachabled Earphone Cable	1.2	Earphone	EUT
Un- shielding Detachabled RJ45 Cable	1.0	EUT	PC

### Block Diagram of Test Setup



---

## SUMMARY OF TEST RESULTS

---

FCC Rules	Description of Test	Results
§15.107	AC Line Conducted Emissions	Compliance
§15.109	Radiated Emissions	Compliance

## FCC §15.107 – AC LINE CONDUCTED EMISSIONS

### Applicable Standard

According to FCC§15.107

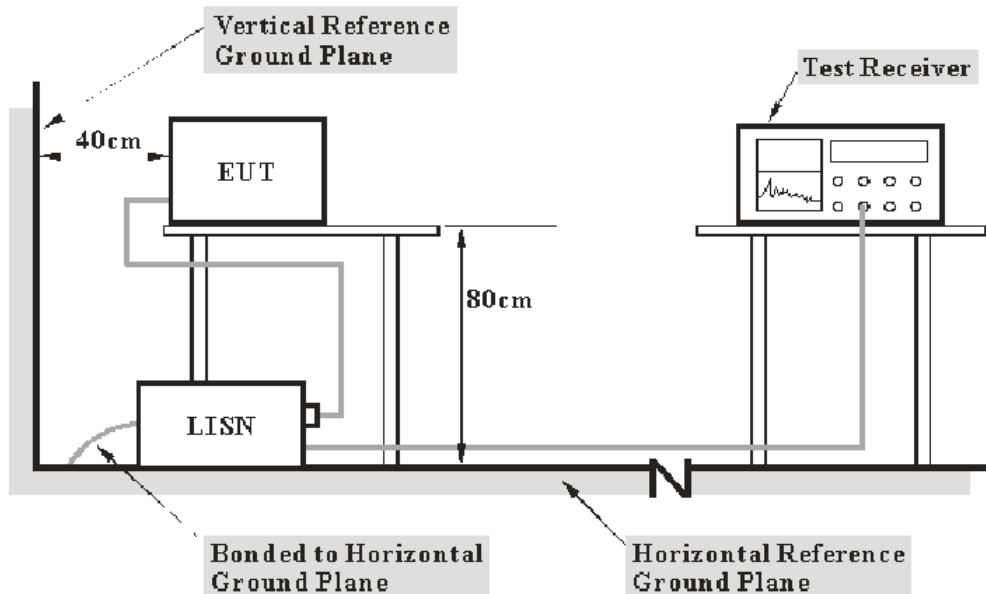
### Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements maybe receiver reading, attenuation of the connection between LISN and receiver, LISN voltage division factor, LISN VDF frequency interpolation and receiver related input quantities, etc.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of conducted disturbance test at Bay Area Compliance Laboratories Corp. (Shenzhen) is shown as below. And the uncertainty will not be taken into consideration for the test data recorded in the report.

Port	Expanded Measurement uncertainty
AC Mains	3.26 dB (k=2, 95% level of confidence)
CAT 3	3.70 dB (k=2, 95% level of confidence)
CAT 5	3.86 dB (k=2, 95% level of confidence)
CAT 6	4.64 dB (k=2, 95% level of confidence)

### EUT Setup



- Note: 1. Support units were connected to second LISN.  
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.



The measurement procedure of EUT setup is according with ANSI C63.4-2009. The related limit was specified in FCC Part 15.107 Class B.

The adapter was connected to an AC 120V/60 Hz power source.

**EMI Test Receiver Setup**

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

**Test Procedure**

During the conducted emission test, the socket was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

**Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCS30	100176	2014-06-03	2015-06-03
Rohde & Schwarz	LISN	ENV216	3560.6650.12-101613-Yb	2014-05-07	2015-05-07
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2013-10-15	2014-10-15
Rohde & Schwarz	CE Test software	EMC 32	V8.53	--	--

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

**Corrected Factor & Margin Calculation**

The Corrected factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

$$\text{Correction Factor} = \text{LISN VDF} + \text{Cable Loss} + \text{Transient Limiter Attenuation}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

## Test Results Summary

According to the recorded data in following table, the worst margin reading as below:

**11.9 dB at 3.218030 MHz** in the **Line** conducted mode

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(L_m)} \leq L_{lim} + U_{cispr}$$

In BACL.,  $U_{(L_m)}$  is less than  $U_{cispr}$ , if  $L_m$  is less than  $L_{lim}$ , it implies that the EUT complies with the limit.

## Test Data

### Environmental Conditions

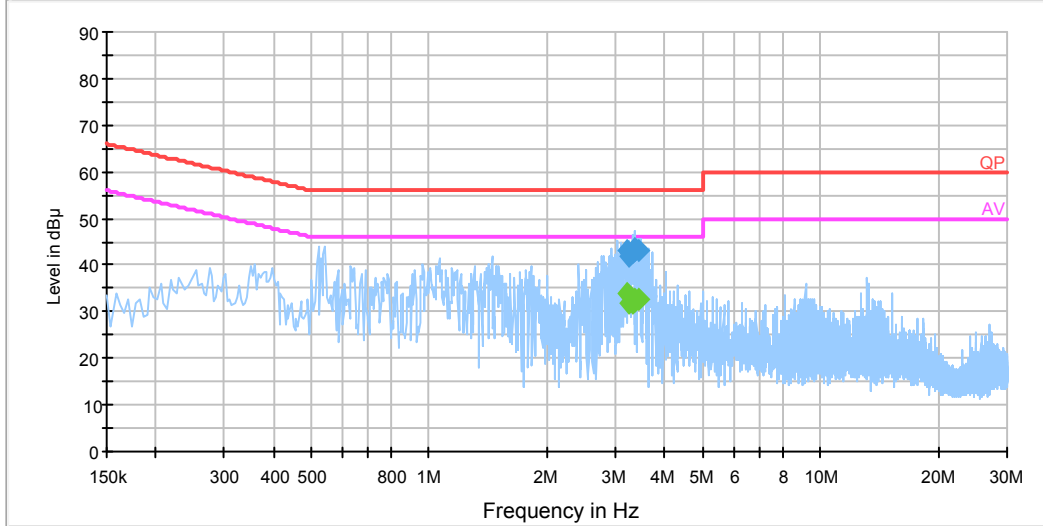
<b>Temperature:</b>	25°C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Joson Xiao on 2014-08-29.*

*Test Mode: Monitor & recording*

AC 120V/60 Hz, Line

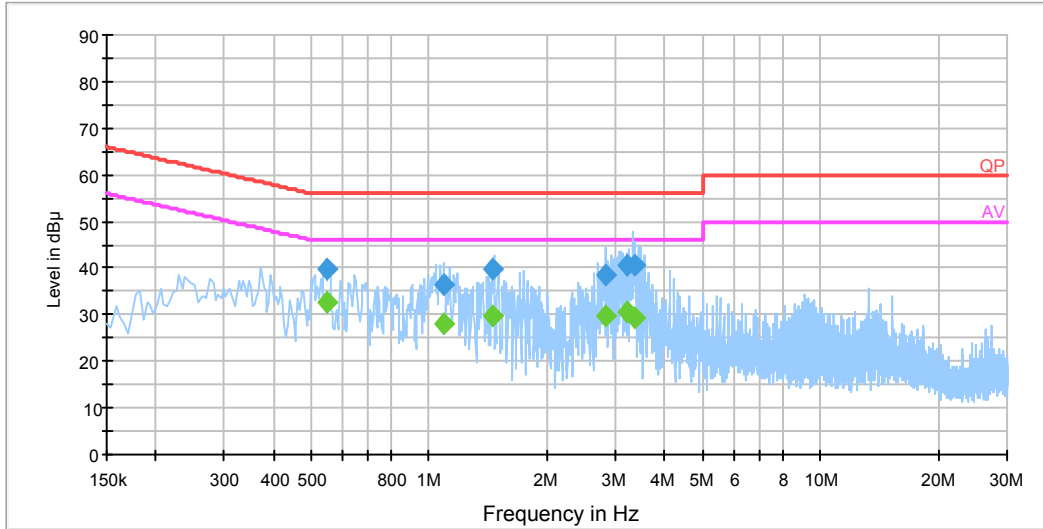
EMI Auto Test L



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
3.218030	43.1	19.7	56.0	12.9	QP
3.218030	34.1	19.7	46.0	11.9	Ave.
3.253610	41.7	19.7	56.0	14.3	QP
3.253610	31.6	19.7	46.0	14.4	Ave.
3.336410	42.7	19.7	56.0	13.3	QP
3.336410	32.0	19.7	46.0	14.0	Ave.
3.371570	43.5	19.7	56.0	12.5	QP
3.371570	32.4	19.7	46.0	13.6	Ave.
3.374850	43.2	19.7	56.0	12.8	QP
3.374850	32.6	19.7	46.0	13.4	Ave.
3.423330	43.1	19.7	56.0	12.9	QP
3.423330	32.7	19.7	46.0	13.3	Ave.

**AC 120V/60 Hz, Neutral**

EMI Auto Test N



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/Ave./QP)
0.545870	39.7	19.6	56.0	16.3	QP
0.545870	32.6	19.6	46.0	13.4	Ave.
1.093650	36.4	19.5	56.0	19.6	QP
1.093650	28.2	19.5	46.0	17.8	Ave.
1.456070	39.9	19.5	56.0	16.1	QP
1.456070	29.6	19.5	46.0	16.4	Ave.
2.811790	38.5	19.7	56.0	17.5	QP
2.811790	29.6	19.7	46.0	16.4	Ave.
3.213550	40.7	19.7	56.0	15.3	QP
3.213550	30.4	19.7	46.0	15.6	Ave.
3.344230	40.6	19.7	56.0	15.4	QP
3.344230	29.3	19.7	46.0	16.7	Ave.

Note:

- 1) Corrected Amplitude = Reading + Correction Factor
- 2) Correction Factor = LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter Attenuation
- 3) Margin = Limit – Corrected Amplitude

## FCC §15.109 - RADIATED SPURIOUS EMISSIONS

### Applicable Standard

FCC §15.109

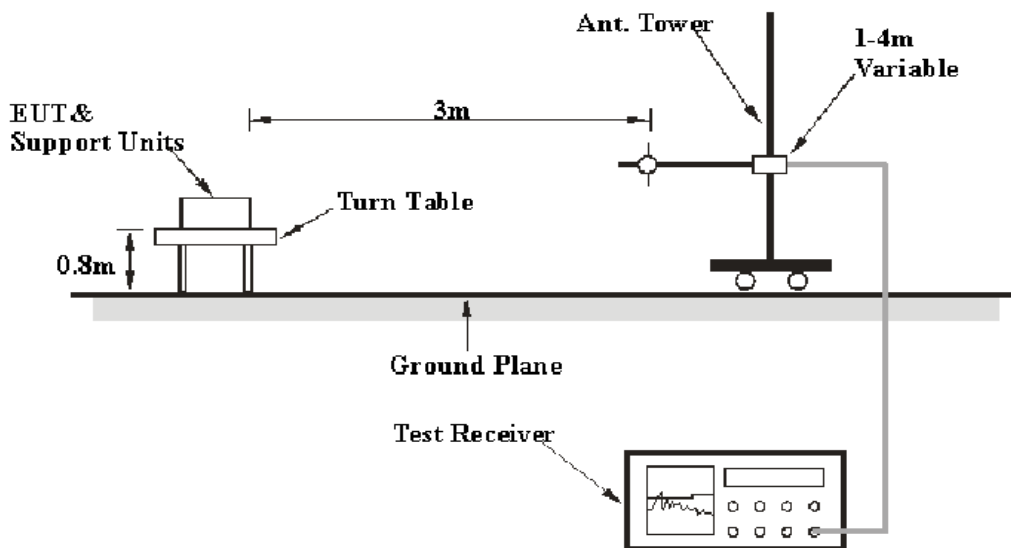
### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR 16-4-2:2011, the expended combined standard uncertainty of radiation emissions at Bay Area Compliance Laboratories Corp. (Shenzhen) is shown in below table. And the uncertainty will not be taken into consideration for the test data recorded in the report

Frequency	Polarity	Measurement uncertainty
30MHz~200MHz	Horizontal	4.62 dB (k=2, 95% level of confidence)
	Vertical	4.54 dB (k=2, 95% level of confidence)
200MHz~1GHz	Horizontal	4.84 dB (k=2, 95% level of confidence)
	Vertical	5.91 dB (k=2, 95% level of confidence)
1 GHz~6 GHz	Horizontal / Vertical	4.68 dB (k=2, 95% level of confidence)
Above 6 GHz	Horizontal / Vertical	4.92 dB (k=2, 95% level of confidence)

### EUT Setup



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with

the ANSI C63.4-2009. The specification used was the FCC Part 15.109 Class B limits.

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.

The adapter was connected to an AC 120V/60 Hz power source.

### EMI Test Receiver Setup

The system was investigated from 30 MHz to 2 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Detector
30MHz – 1000 MHz	100 kHz	300 kHz	120kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz	/	Ave.

### Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All final data was recorded in the Quasi-peak detector mode.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
TDK	Chamber	Chamber A	2#	2012-10-15	2015-10-15
HP	Amplifier	8447E	1937A01046	2013-09-30	2014-09-30
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2013-11-12	2014-11-12
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
R&S	Auto test Software	EMC32	V9.10	-	-
TDK	Chamber	Chamber B	1#	2011-07-23	2015-07-22
BIZI	Signal Analyzer	FSIQ26	8386001028	2013-11-12	2014-11-12
A. H. System	Horn Antenna	SAS-200/571	135	2012-02-11	2015-02-10
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2014-04-03	2015-04-03

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

## Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7 dB means the emission is 7 dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

## Test Results Summary

According to the recorded data in following table, the worst margin reading as below:

**0.49 dB at 399.912500 MHz in the Vertical polarization**

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level complies with the limit if

$$L_m + U_{(Lm)} \leq L_{lim} + U_{cispr}$$

In BACL,  $U_{(Lm)}$  is less than  $U_{cispr}$ , if  $L_m$  is less than  $L_{lim}$ , it implies that the EUT complies with the limit.

## Test Data

### Environmental Conditions

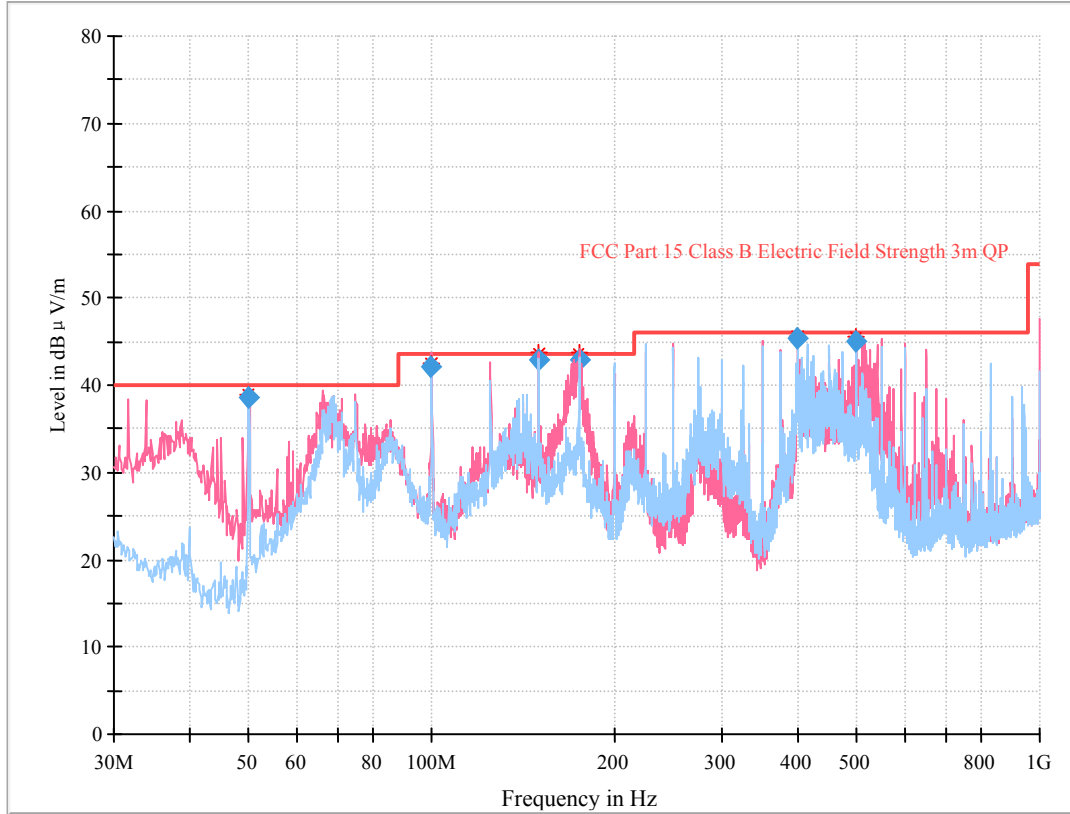
<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	50 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Webb Liu on 2014-08-30.*

*Test mode: Monitor & recording*

30 MHz ~ 1 GHz

Full Spectrum



Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity	Turntable Position (Degree)	Correction Factor (dB/m)	Limit (dBμV/m)	Margin (dB)
50.006251	38.53	102.0	H	213.0	-19.6	40.00	1.47
99.988765	42.06	124.0	H	106.0	-16.8	43.50	1.44
149.992375	42.94	100.0	V	158.0	-13.8	43.50	0.56
174.974250	42.81	100.0	V	172.0	-14.9	43.50	0.69
399.912500	45.51	211.0	V	208.0	-10.4	46.00	0.49
499.899625	45.12	224.0	V	79.0	-8.6	46.00	0.88

Note:

- 1) Corrected Amplitude = Meter Reading + Correction Factor
- 2) Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain
- 3) Margin = Limit – Corrected Amplitude



**1 G Hz ~ 2 GHz**

Frequency (MHz)	Reading (dB $\mu$ V)	Detector (PK/QP/Ave.)	Turntable Degree	Height (m)	Polar (H/V)	Corrected Factor (dB/m)	Corrected Amplitude (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
1200.40	63.52	PK	278	1.2	V	0.13	63.65	74	10.35
1200.40	42.64	Ave.	278	1.2	V	0.13	42.77	54	11.23
1200.40	63.96	PK	278	1.2	H	0.13	64.09	74	9.91
1200.40	43.07	Ave.	278	1.2	H	0.13	43.2	54	10.8
1801.60	53.60	PK	179	1.5	H	2.32	55.92	74	18.08
1801.60	38.79	Ave.	179	1.5	H	2.32	41.11	54	12.89

## Note:

- 1) Correction Factor=Antenna factor (RX) + cable loss – amplifier factor
- 2) Corrected Amplitude = Correction Factor + Reading
- 3) Margin = Limit - Corrected Amplitude

## PRODUCT SIMILARITY DECLARATION LETTER

**FOSCAM**

ShenZhen Foscam Intelligent Technology Co., Ltd.  
Address: 5/F, Block 1, Vision Business Park, Nanshan District, Shenzhen, PRC  
Tel: 0755-26720367-8306; Fax: 0755-26745168

2014-8-8

### Product Similarity Declaration

To Whom It May Concern,

We, ShenZhen Foscam Intelligent Technology Co.,Ltd., hereby declare that we have a product named as Wireless IP Camera (Model number: FI9826P V2) was tested by BACL, meanwhile, for our marketing purpose, we would like to list a series models (HD818P V2,EH8155 V2,FI9826W V2,FC2503WZ V2,FC2503PZ V2) on reports and certificate, all the models are identical schematics, except for the differences as below, FI9826P V2 and HD818P V2,EH8155 V2,FI9826W V2,FC2503WZ V2,FC2503PZ V2 are only different in model numbers.

No other changes are made to them.

We confirm that all information above is true, and we'll be responsible for all the consequences. Please contact me if you have any question.

Signature:

Yidong Xu

Manager

*Yidong Xu*

*8/8, 2014*

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