

FCC PART 15, CLASS B TEST REPORT

For

ShenZhen Foscam Intelligent Technology Co., Ltd

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

FCC ID: ZDEC2

Report Type: Original Report	Product Type: FHD Wireless IP Camera
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Report Number: <u>RSZ150612007-00A</u>	
Report Date: <u>2015-06-26</u>	
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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

GENERAL INFORMATION.....	3
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	3
OBJECTIVE	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST FACILITY	3
SYSTEM TEST CONFIGURATION	4
DESCRIPTION OF TEST CONFIGURATION	4
EUT EXERCISE SOFTWARE	4
SPECIAL ACCESSORIES.....	4
EQUIPMENT MODIFICATIONS	4
SUPPORT EQUIPMENT LIST AND DETAILS	4
EXTERNAL I/O CABLE.....	5
BLOCK DIAGRAM OF TEST SETUP	5
SUMMARY OF TEST RESULTS	6
FCC §15.107 – AC LINE CONDUCTED EMISSIONS	7
APPLICABLE STANDARD	7
MEASUREMENT UNCERTAINTY.....	7
EUT SETUP	7
EMI TEST RECEIVER SETUP.....	8
TEST PROCEDURE	8
TEST EQUIPMENT LIST AND DETAILS.....	8
CORRECTED FACTOR & MARGIN CALCULATION	8
TEST RESULTS SUMMARY	9
TEST DATA	9
FCC §15.109 - RADIATED SPURIOUS EMISSIONS	12
APPLICABLE STANDARD	12
MEASUREMENT UNCERTAINTY.....	12
EUT SETUP	12
EMI TEST RECEIVER SETUP.....	13
TEST PROCEDURE	13
TEST EQUIPMENT LIST AND DETAILS.....	13
CORRECTED AMPLITUDE & MARGIN CALCULATION	14
TEST RESULTS SUMMARY	14
TEST DATA	14
PRODUCT SIMILARITY DECLARATION LETTER.....	16

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *ShenZhen Foscam Intelligent Technology Co., Ltd*'s product, model number: C2 or the "EUT" in this report was a *FHD Wireless IP Camera*, which was measured approximately: 7.0 cm (L) x 7.0 cm (W) x 6.3 cm (H), rated with input voltage: DC 5V from adapter. The highest operating frequency is 600 MHz.

Adapter Information:

Model: SAW06-050-1000U

Input: 100~240V, 50~60Hz, 0.3A

Output: 5V, 1000mA

Note: This series products model: IQ200, C3, C4, C2 Plus, C3 Plus, C4 Plus, IQ200 Plus, IQ300 Plus, IQ400 Plus, FC1608P and C2 are identical schematics, the difference among them is just the model number due to marketing purpose, and model C2 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: 1505392 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2015-06-12.*

Objective

This test report is prepared on behalf of *ShenZhen Foscam Intelligent Technology Co., Ltd* in accordance with Part 2-Subpart J, Part 15-Subparts A and B of the Federal Communication Commissions rules.

The objective of the manufacturer is to determine the compliance of the EUT with FCC Part 15 B.

Related Submittal(s)/Grant(s)

FCC PART 15.247 DTS submissions with transmitter FCC ID: ZDEC2.

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

Description of Test Configuration

The system was configured for testing in normal mode.

EUT operation mode: Recording & monitoring

EUT Exercise Software

“BurnIn test v5.3” and “IP camera” exercise software were used.

Special Accessories

The accessories were provided by manufactures.

Equipment Modifications

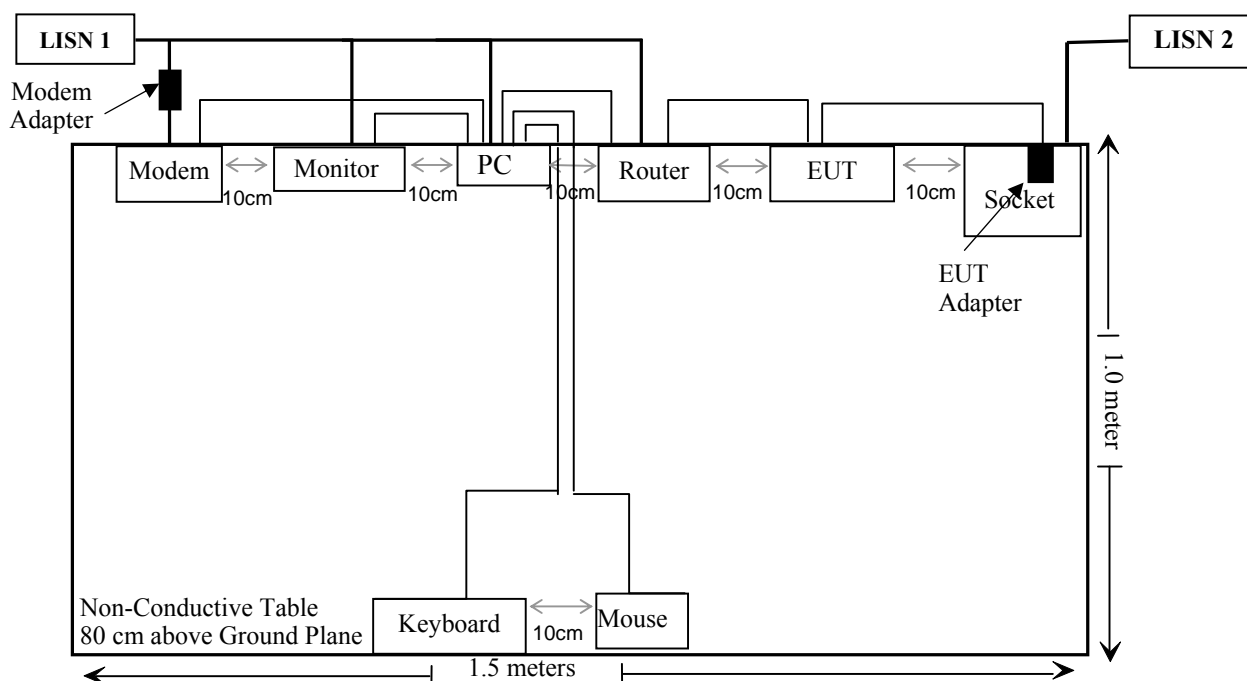
No modification was made to the EUT tested.

Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
BULL	Scoket	GN-415K	5503290068073
DELL	Monitor	E178FPc	070072
DELL	PC	Inspriion660	6104472
DELL	PC	DCSCSF	127BP2X
ECOM	Modem	56000bps	21654684
LISTED	EUT Adapter	TYP60-1207000Z	326703
DELL	Keyboard	SK-8115	CN-0DJ313-71616-0CE-0ATX
N/A	Mouse	N/A	1021501
N/A	Modem Adapter	N/A	2547812
Sagemcom	Router	N/A	32546

External I/O Cable

Cable Description	Length (m)	From Port	To
Shielding Un-detachable USB cable	1.5	PC	mouse
Shielding Un-detachable USB cable	1.5	PC	keyboard
Shielding Detachable RJ45 cable	1.2	PC	Router
Shielding Detachable VGA cable	1.5	PC	Monitor
Shielding Detachable RJ45 cable	1.6	EUT	Router
Un-shielding Un-detachable DC cable	1.6	Mains	Router
Un-shielding Un-detachable RS232 cable	1.5	PC	Modem
Shielding Detachable USB cable	1.5	EUT Adapter	EUT
Un-shielding Un-detachable AC cable	1.8	Socket	mains
Un-shielding Detachable AC cable	1.5	Modem Adapter	mains
Un-shielding Un-detachable DC cable	1.5	Modem Adapter	Modem
Un-shielding Detachable AC cable	1.6	PC	Mains
Un-shielding Detachable AC cable	1.6	monitor	Mains

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 Spurious Emissions	Compliance

FCC §15.107 – AC LINE CONDUCTED EMISSIONS

Applicable Standard

According to FCC §15.107

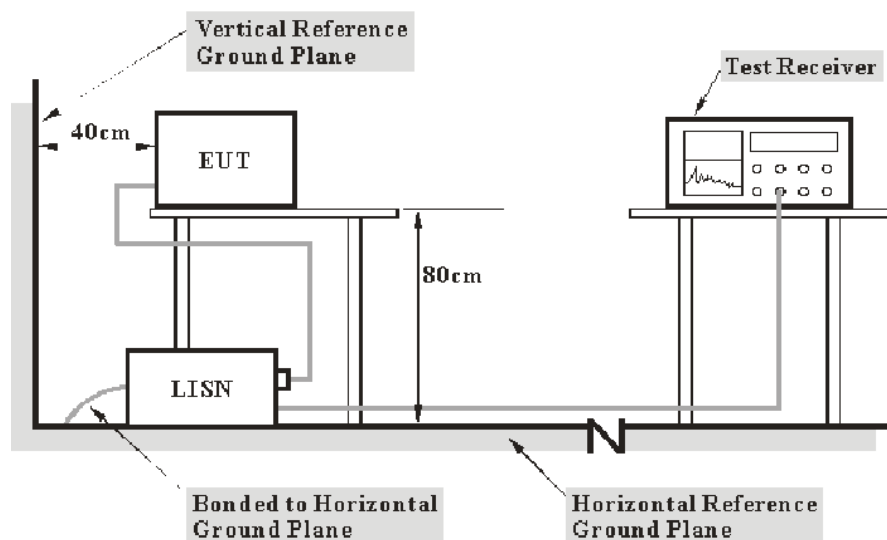
Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements maybe receiver reading, attenuation of the connection between LISN/ISN and receiver, LISN/ISN voltage division factor, LISN/ISN 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 per ANSI C63.4-2009. The related limit was specified in FCC Part 15.107 Class B.

The spacing between the peripherals was 10 cm.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The socket was connected to a 120 VAC/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 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	2015-06-03	2016-06-03
Rohde & Schwarz	LISN	ENV216	3560.6650.12-101613-Yb	2014-12-01	2015-12-01
Rohde & Schwarz	LISN	ESH3-Z5	100113	NCR	NCR
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2015-05-14	2016-05-14
Rohde & Schwarz	CE Test software	EMC 32	V8.53	NCR	NCR

* **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/ISN 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 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 EUT complied with the FCC Part 15.107, the worst margin reading as below:

0.6 dB at 0.443430 MHz in the Line conducted mode

Refer to CISPR16-4-2:2011 and CISPR 16-4-1:2009, the measured level is in 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

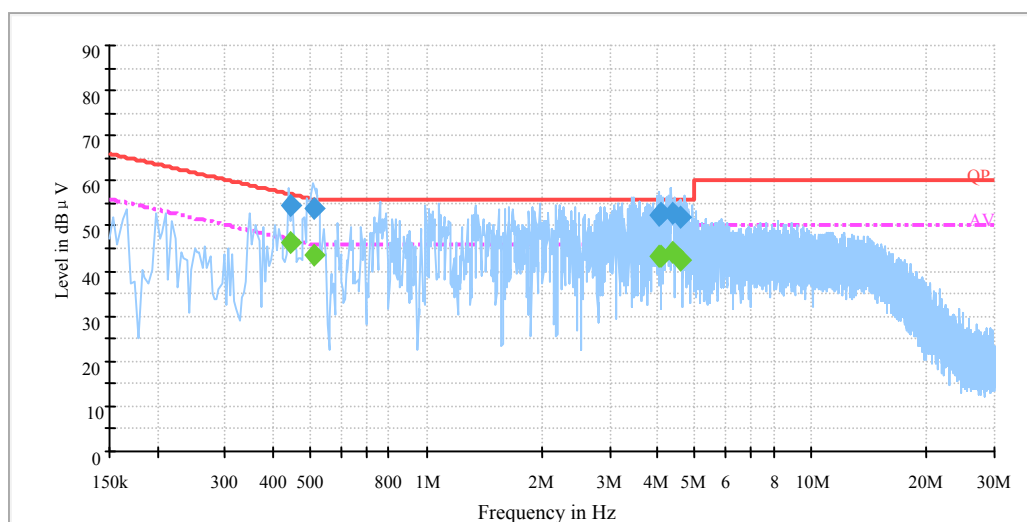
Temperature:	28 °C
Relative Humidity:	45 %
ATM Pressure:	101.0 kPa

The testing was performed by David Lee on 2015-06-24.

EUT Operation Mode: monitoring with RJ45 port

AC 120V/60 Hz, Line

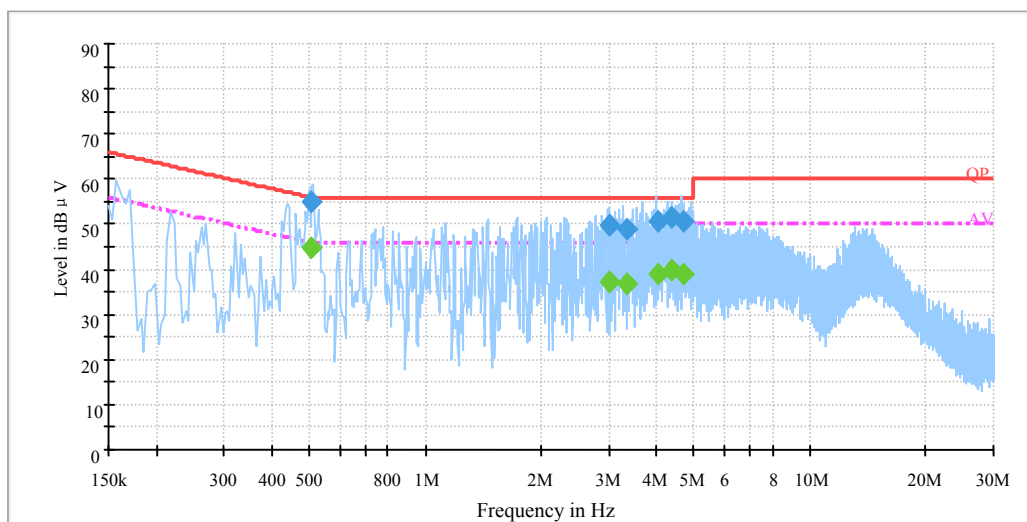
EMI Auto Test L



Frequency (MHz)	Corrected Amplitude (dBμV)	Correction Factor (dB)	Limit (dBμV)	Margin (dB)	Detector (PK/Ave./QP)
0.443430	54.7	19.9	57.0	2.3	QP
0.443430	46.4	19.9	47.0	0.6	Ave.
0.510350	54.0	19.9	56.0	2.0	QP
0.510350	43.3	19.9	46.0	2.7	Ave.
4.044530	52.2	20.0	56.0	3.8	QP
4.044530	43.1	20.0	46.0	2.9	Ave.
4.073610	53.0	20.0	56.0	3.0	QP
4.073610	43.3	20.0	46.0	2.7	Ave.
4.348810	52.9	20.0	56.0	3.1	QP
4.348810	43.9	20.0	46.0	2.1	Ave.
4.607890	51.9	20.0	56.0	4.1	QP
4.607890	42.5	20.0	46.0	3.5	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)
0.502350	55.0	19.9	56.0	1.0	QP
0.502350	45.0	19.9	46.0	1.0	Ave.
3.021090	49.7	20.0	56.0	6.3	QP
3.021090	37.1	20.0	46.0	9.0	Ave.
3.324710	49.1	20.0	56.0	7.0	QP
3.324710	36.9	20.0	46.0	9.1	Ave.
4.041730	50.7	20.0	56.0	5.3	QP
4.041730	38.8	20.0	46.0	7.2	Ave.
4.350290	51.5	20.0	56.0	4.5	QP
4.350290	39.9	20.0	46.0	6.1	Ave.
4.676490	50.6	20.0	56.0	5.4	QP
4.676490	39.0	20.0	46.0	7.0	Ave.

Note:

- 1) Correction Factor = LISN VDF (Voltage Division Factor) + Cable Loss + Transient Limiter Attenuation
The corrected factor has been input into the transducer of the test software.
- 2) Corrected Amplitude = Reading + Correction Factor
- 3) Margin = Limit – Corrected Amplitude

FCC §15.109 - RADIATED SPURIOUS EMISSIONS

Applicable Standard

FCC §15.109

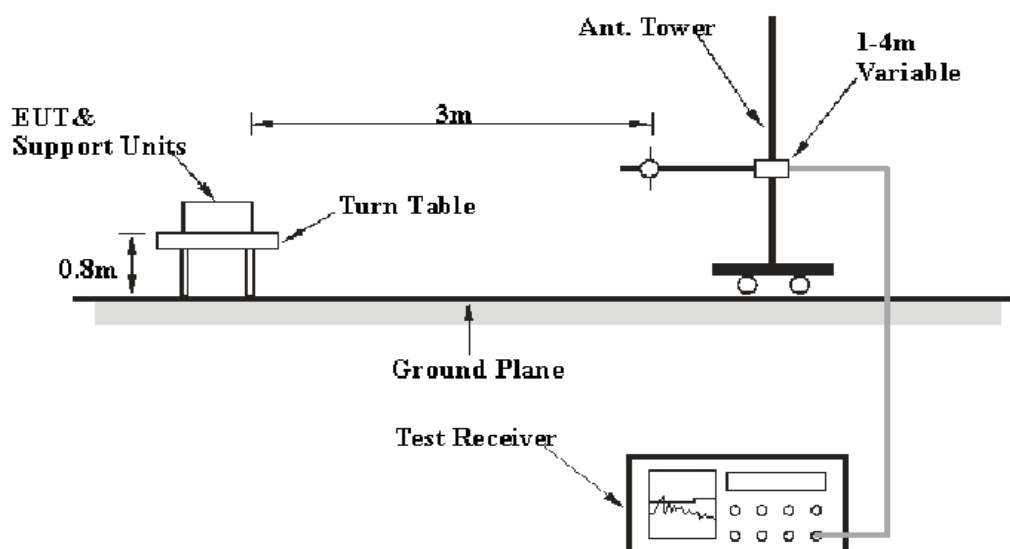
Measurement Uncertainty

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 expanded 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
30 MHz~200 MHz	Horizontal	4.62 dB (k=2, 95% level of confidence)
	Vertical	4.54 dB (k=2, 95% level of confidence)
200 MHz~1 GHz	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 socket was connected to a 120 VAC/60 Hz power source.

EMI Test Receiver Setup

The system was investigated from 30 MHz to 6 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
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	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 data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz and PK and average detector modes for frequencies above 1 GHz.

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
Sunol Sciences	Bi-log Antenna	JB1	A040904-2	2014-12-07	2017-12-06
Rohde & Schwarz	EMI Test Receiver	ESCI	101120	2014-11-03	2015-11-03
HP	Amplifier	HP8447E	1937A01046	2015-05-06	2016-05-06
TDK	Chamber	Chamber B	1#	2012-07-22	2015-07-22
BIZI	Signal Analyier	FSIQ26	8386001028	2014-11-12	2015-11-12
A.H.System	Horn Antenna	SAS-200/571	135	2013-02-11	2016-02-10
Mini	Pre-amplifier	ZVA-183-S+	5969001149	2015-04-23	2016-04-23
Rohde & Schwarz	RE Test software	EMC 32	V9.10.00	NCR	NCR

* **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 data in the following table, the EUT complied with the FCC §15.109 Class B, the worst margin reading as below:

7.31 dB at 50.000375 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

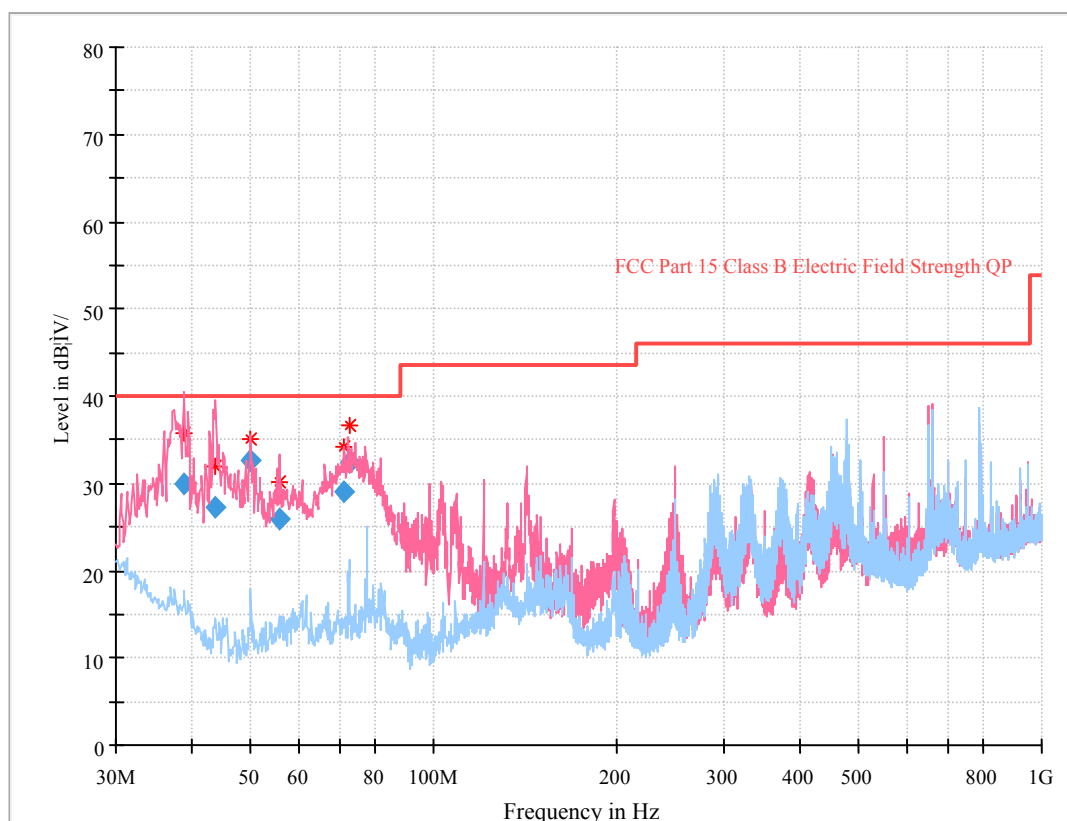
Temperature:	28 °C
Relative Humidity:	45 %
ATM Pressure:	101.0 kPa

The testing was performed by David Lee on 2015-06-24.

EUT operation mode: monitoring with RJ45 port

30 MHz to 1 GHz

Full Spectrum



Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Ant. Polarity (H/V)	Turntable Position (degree)	Correction Factor (dB)	Limit (dBμV/m)	Margin (dB)
38.941250	29.96	110.0	V	0.0	-12.7	40.00	10.04
43.774625	27.29	128.0	V	247.0	-16.2	40.00	12.71
50.000375	32.69	124.0	V	248.0	-19.6	40.00	7.31
55.850625	26.03	108.0	V	341.0	-20.1	40.00	13.97
71.081250	29.01	118.0	V	325.0	-19.6	40.00	10.99
72.526125	32.43	113.0	V	336.0	-19.5	40.00	7.57

Note:

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

Above 1 GHz:

Note: The data which 20dB below the limit was not recorded.

PRODUCT SIMILARITY DECLARATION LETTER

FOSCAM

ShenZhen Foscam Intelligent Technology Co.,Ltd.
5/F, Block 1, Vision Business Park, Nanshan District, Shenzhen, PRC
Tel: 86-0755-26720367-8306

2015-6-26

Product Similarity Declaration

To Whom It May Concern,

We, ShenZhen Foscam Intelligent Technology Co.,Ltd., hereby declare that we have a product named as FHD Wireless IP Camera (Model number: C2) was tested by BACL, meanwhile, for our marketing purpose, we would like to list a series models (IQ200, C3, C4, C2 Plus, C3 Plus, C4 Plus, IQ200 Plus, IQ300 Plus, IQ400 Plus, FC1608P) on reports and certificate, all the models are identical schematics, only named differently.

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.

Sincerely,

Signature

YIDONG XU

Manager

Yi Dong Xu

6/26, 2015

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