

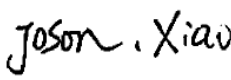
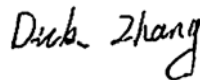
FCC PART 15B, CLASS B
MEASUREMENT AND TEST REPORT

For

ShenZhen Foscam Intelligent Technology Co., Ltd.

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

FCC ID: ZDEFI9805E

HD Wireless IP Camera Original Report	Product Type: Outdoor HD PoE IP Camera
Test Engineer: <u> Joson Xiao </u>	
Report Number: <u> RSZ130815001-00 </u>	
Report Date: <u> 2013-12-25 </u>	
Reviewed By: <u> Dick Zhang EMC Leader </u>	
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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The *ShenZhen Foscam Intelligent Technology Co., Ltd.*'s product, model number: *FI9805E* (FCC ID: *ZDEFI9805E*) or the "EUT" in this report is a *Outdoor HD PoE IP Camera*, which was measured approximately: 205 mm (L) x 87.6 mm (W) x 82.5 mm (H), rated with input voltage: DC 12V from adapter. The highest operating frequency is 440 MHz.

Adapter Information:

Model: SAW24-120-2000

Input: 100-240V~50/60Hz, 0.8A

Output: DC 12V, 2000mA

Note: Product Outdoor HD PoE IP Camera, model FI9805E, HD953E and FC5511E, they are just different in model number due to the marketing purposes, model FI9805E was selected for fully testing, which was explained in 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: 1308058 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2013-08-15.*

Objective

This 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 EUT with FCC Part 15B, Class B.

Related Submittal(s)/Grant(s)

No related submittal.

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 a typical mode which is provided by manufacture.

EUT Exercise Software

No exercise software was used.

Equipment Modifications

No modification was made to the EUT tested.

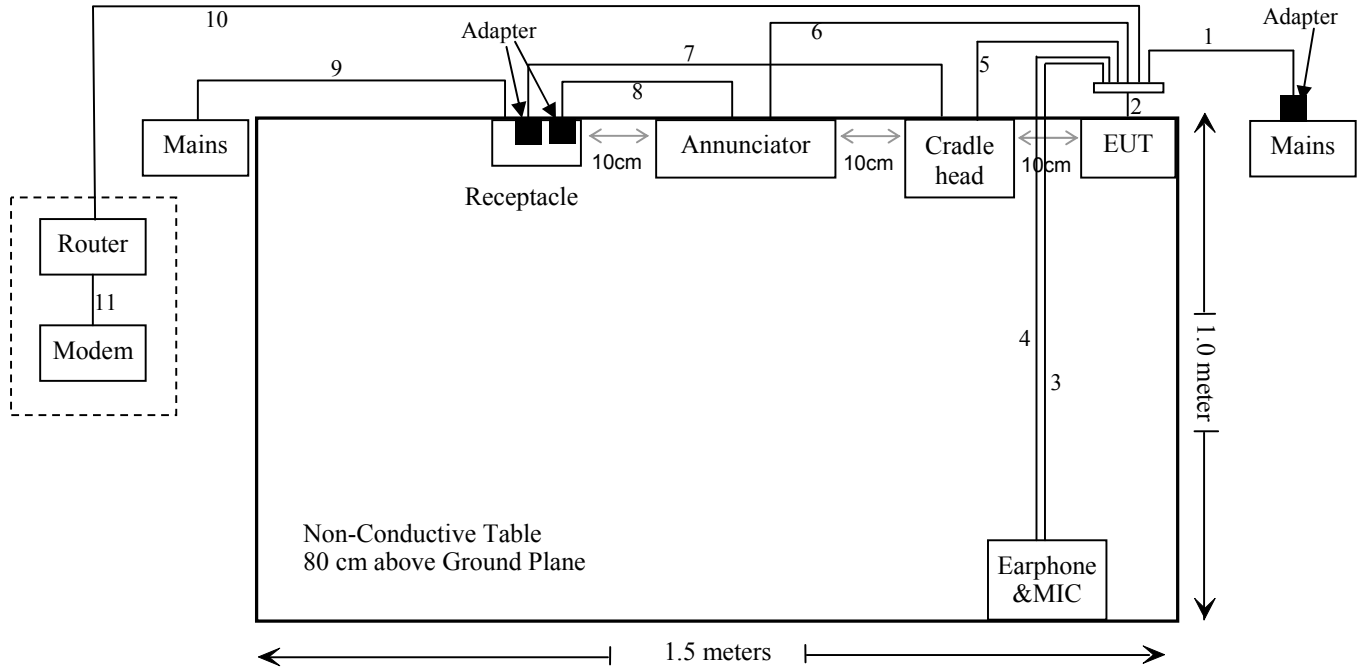
Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	Remark
HP	Earphone& MIC	SHMI500	SHMI1500	EMI/EMS
DR	Cradle head	36HM1403N-105AD	20111020	EMI/EMS
N/A	Annunciator	N/A	54682129	EMI/EMS
N/A	Adapter	N/A	E203014	EMI/EMS
Intertek	Adapter*2	SAW24-120-2000	E210567	EMI/EMS
Sagemcom	Router	N/A	17040V	EMI/EMS
DELL	PC	DCSCSF	127BPX2	EMI
DELL	PC	Insprion 660	110634-11	EMS
ZIDANTOU	Socket	TS-305	20100415JY17	EMI/EMS

External I/O Cable

	Cable Description	Length (m)	From/Port	To
1	Unshielded Undetachable DC Cable	1.0	Adapter	Connector
2	Unshielded Undetachable signal Cable	1.0	EUT	Connector
3	Unshielded Undetachable audio Cable	1.5	Earphone &MIC	Connector
4	Unshielded Undetachable earphone Cable	1.5	Earphone &MIC	Connector
5	Unshielded detachable signal Cable	0.5	Cradle head	Connector
6	Unshielded detachable signal Cable	0.5	Annunciator	Connector
7	Unshielded Undetachable DC Cable	1.0	Adapter	Cradle head
8	Unshielded Undetachable DC Cable	1.0	Adapter	Annunciator
9	Unshielded Undetachable AC Cable	1.0	Mains	Socket
10	Unshielded detachable RJ45 Cable	3.0	Router	Connector
11	Unshielded detachable RJ45 Cable	1.0	Router	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

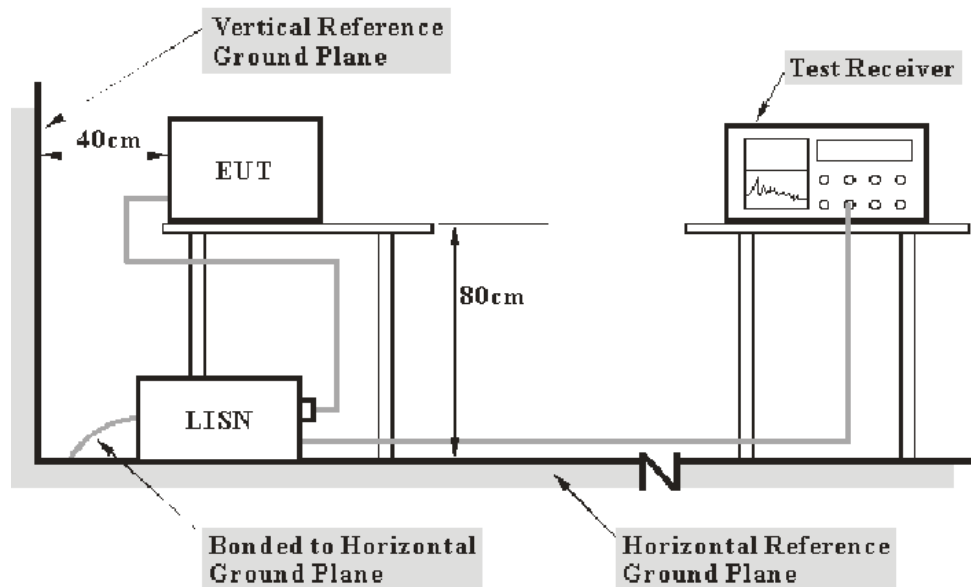
Measurement Uncertainty

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

Based on CISPR 16-4-2:2011, the expanded 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	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

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

All 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	2013-06-17	2014-06-17
Rohde & Schwarz	LISN 1	ENV216	3560.6650.12-101613-Yb	2013-05-07	2014-05-07
Rohde & Schwarz	LISN 2	ESH2-Z5	892107/021	2013-08-09	2014-08-09
Rohde & Schwarz	Transient Limiter	ESH3Z2	DE25985	2012-10-15	2013-10-15
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/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 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, with the worst margin reading of:

7.3 dB at 26.610000 MHz in the Line conducted mode

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

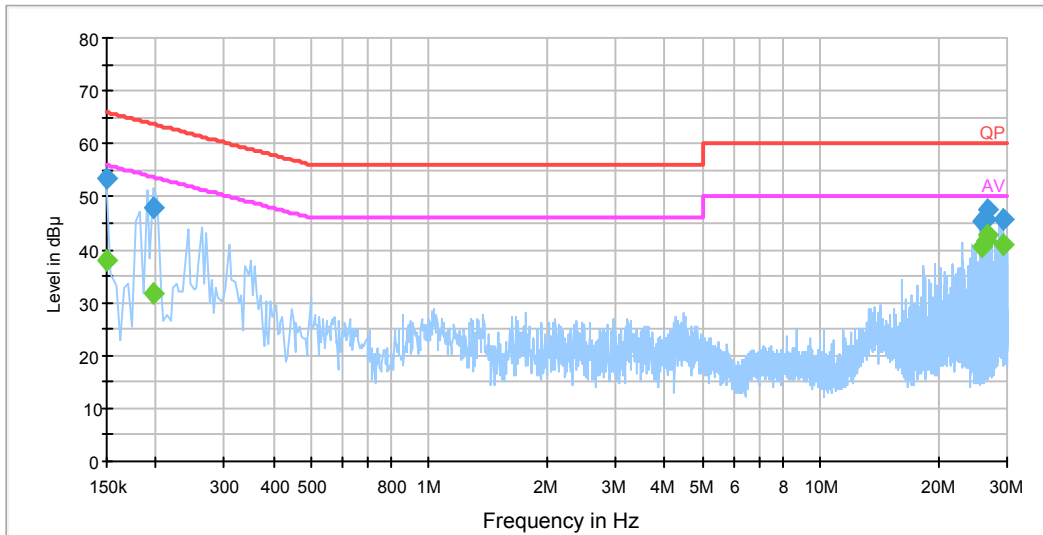
Temperature:	26 °C
Relative Humidity:	55 %
ATM Pressure:	101.0 kPa

The testing was performed by Joson Xiao on 2013-09-09.

EUT operation mode: Running

AC 120V/60 Hz, Line

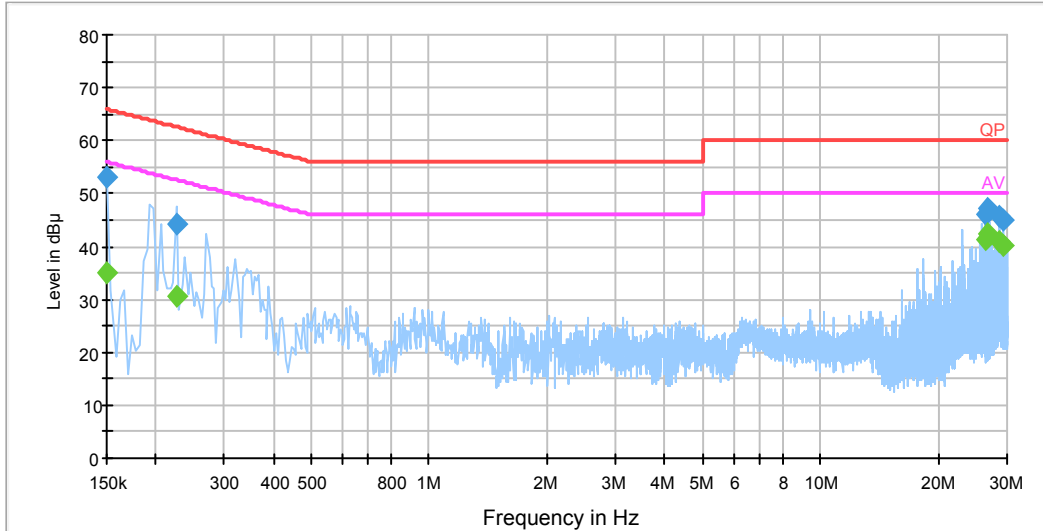
EMI Auto Test L



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/ QP/Ave.)
0.150000	53.4	19.5	66.0	12.6	QP
0.150000	37.9	19.5	56.0	18.1	Ave.
0.198000	47.9	19.5	63.7	15.8	QP
0.198000	31.9	19.5	53.7	21.8	Ave.
25.878000	45.3	20.3	60.0	14.7	QP
25.878000	40.5	20.3	50.0	9.5	Ave.
26.550000	45.9	20.3	60.0	14.1	QP
26.550000	41.5	20.3	50.0	8.5	Ave.
26.610000	47.4	20.3	60.0	12.6	QP
26.610000	42.7	20.3	50.0	7.3	Ave.
29.238000	45.6	20.4	60.0	14.4	QP
29.238000	40.8	20.4	50.0	9.2	Ave.

AC 120V/60 Hz, Neutral

EMI Auto Test N



Frequency (MHz)	Corrected Amplitude (dBµV)	Correction Factor (dB)	Limit (dBµV)	Margin (dB)	Detector (PK/ QP/Ave.)
0.150000	53.1	19.5	66.0	12.9	QP
0.150000	34.9	19.5	56.0	21.1	Ave.
0.226000	44.2	19.5	62.6	18.4	QP
0.226000	30.5	19.5	52.6	22.1	Ave.
26.490000	46.0	20.4	60.0	14.0	QP
26.490000	41.4	20.4	50.0	8.6	Ave.
26.610000	47.1	20.4	60.0	12.9	QP
26.610000	42.4	20.4	50.0	7.6	Ave.
28.686000	45.9	20.5	60.0	14.1	QP
28.686000	40.9	20.5	50.0	9.1	Ave.
29.238000	44.9	20.5	60.0	15.1	QP
29.238000	40.3	20.5	50.0	9.7	Ave.

Note:

- 1) Correction Factor = LISN/ISN 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 EMISSIONS

Applicable Standard

According to FCC §15.109

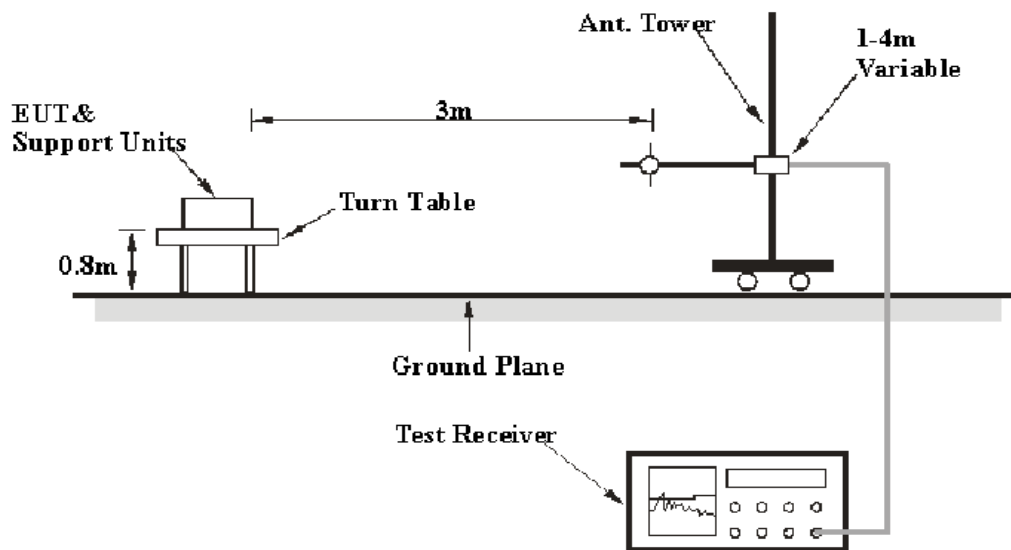
Measurement Uncertainty

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
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 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 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
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 detection mode from 30 MHz to 1 GHz, Peak and average detection mode above 1 GHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447E	1937A01046	2013-09-30	2014-09-30
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2013-09-17	2014-09-17
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
SUPER ULTRA	Amplifier	ZVA-183-S+	5969001149	2013-04-03	2014-04-03
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2014-11-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2013-11-12	2014-11-12
R&S	Auto test Software	EMC32	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 Amplitude & Margin Calculation

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

$$\text{Correction Factor} = \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB 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, with the worst margin reading of:

5.0 dB at 80.000450 MHz in the Vertical polarization

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

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

in BAACL, $U_{(Lm)}$ 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

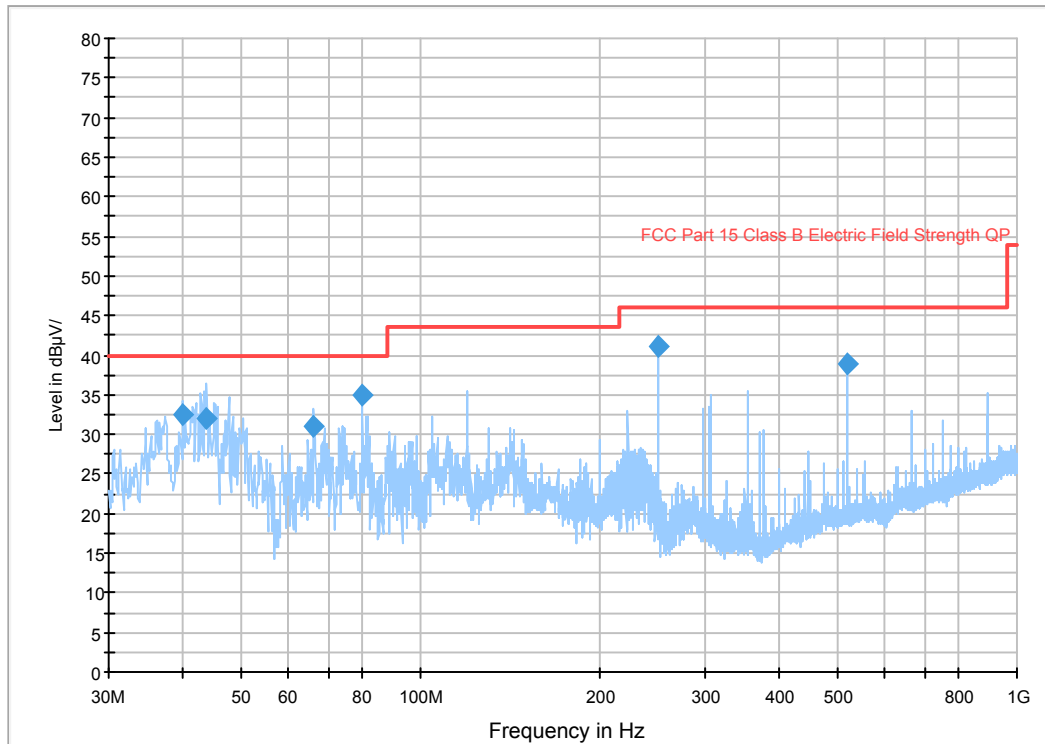
Temperature:	22 °C
Relative Humidity:	53 %
ATM Pressure:	101.0 kPa

The testing was performed by Joson Xiao on 2013-11-18.

EUT operation mode: Running

1) 30 MHz~1 GHz:

Auto Test(FCC part 15 Class B)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Ant. Polarity (H/V)	Turntable Position (degree)	Correction Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
40.000400	32.6	100.0	V	105.0	-13.3	40.0	7.4
43.839000	32.0	101.0	V	105.0	-16.0	40.0	8.0
66.294550	31.0	122.0	V	147.0	-19.4	40.0	9.0
80.000450	35.0	137.0	V	164.0	-19.0	40.0	5.0
250.005000	41.0	114.0	H	107.0	-13.3	46.0	5.0
519.746650	38.8	182.0	H	95.0	-6.7	46.0	7.2

Note:

- 1) Corrected Amplitude = Meter Reading + Correction Factor
- 2) Correction Factor = Antenna Factor + Cable Loss - Amplifier Gain
The corrected factor has been input into the transducer of the test software.
- 3) Margin = Limit – Corrected Amplitude

2) Above 1 GHz

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB/m)	Corrected Amplitude (dB μ V/m)	FCC Part 15.109	
	Reading (dB μ V)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dB μ V/m)	Margin (dB)
1060.1	50.32	PK	72	1.3	V	-0.66	49.66	74	24.34
1060.1	38.34	Ave.	72	1.3	V	-0.66	37.68	54	16.32
1501.0	43.02	PK	269	1.2	H	1.15	44.17	74	29.83
1501.0	30.68	Ave.	269	1.2	H	1.15	31.83	54	22.17
1751.5	57.03	PK	339	1.5	V	2.32	59.35	74	14.65
1751.5	42.02	Ave.	339	1.5	V	2.32	44.34	54	9.66

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



ShenZhen Foscam Intelligent Technology Co.,Ltd.

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Tel: 0755-26745668 Fax: 0755-26745168

2013-8-22

Product Similarity Declaration

To Whom It May Concern,

We, ShenZhen Foscam Intelligent Technology Co.,Ltd. hereby declare that our IP Camera, Model Number: HD953E, FC5511E are electrically identical with FI9805E that was certified by BACL. They are just different in model numbers due to marketing purposes.

Please contact me if you have any question.

Yidong Xu
Manager

Xu Yidong
8/22, 2013

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