

# FCC PART 15 B, CLASS B TEST REPORT

For

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

5/F, Block 1, Vision Business Park, Nanshan District, Shenzhen, Guangdong Province, China

**FCC ID: ZDEFI9805W**

<b>Report Type:</b> Original Report	<b>Product Type:</b> IP Camera
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<b>Report Number:</b> RSZ130508004-00A	
<b>Report Date:</b> 2013-07-16	
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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.

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## GENERAL INFORMATION

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

The *ShenZhen Foscam Intelligent Technology Co., Ltd.*'s product, model number: *FI9805W* (FCC ID: *ZDEFI9805W*) or the "EUT" in this report was an *IP Camera*, which was measured approximately: 18.0cm (L) x 9.8 cm (W) x 10.3 cm (H), rated with input voltage: DC 12V from adapter. The highest operating frequency is 480 MHz.

#### Adapter Information:

Model: SAW24-120-2000

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

Output: DC 12V, 2.0A

*Note: Product IP Camera, model FI9805W, FI9804W, HD953W, HD951W, FC5511W and FC5411W, they are just different from the model number due to the marketing purposes, model FI9805W 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: 1305033 (Assigned by BACL, Shenzhen). The EUT supplied by the applicant was received on 2013-05-08.*

### 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 FCC ID: ZDEFI9805W.

### 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 manufacturer testing fashion.

### EUT Exercise Software

N/A

### Equipment Modifications

No modification was made to the EUT tested.

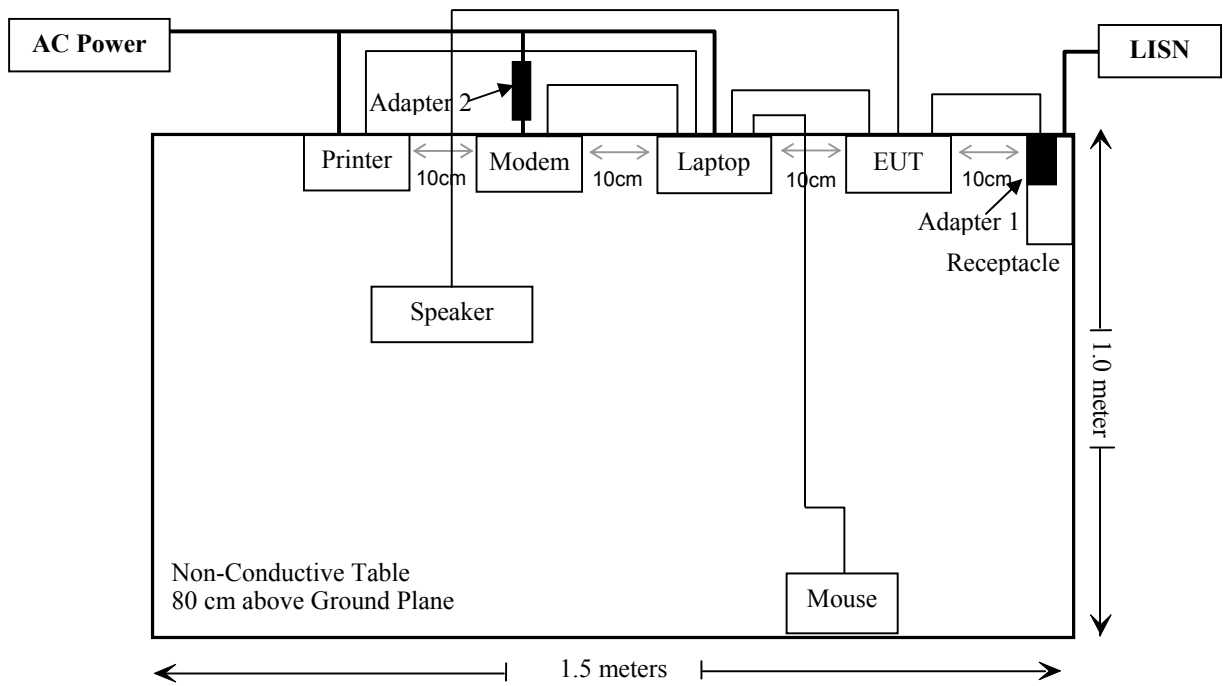
### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
DELL	Laptop	PP111L	N/A
DELL	Mouse	MOC5UO	G1B0096D
SAST	Modem	AEM-2100	0293
HP	Laser Jet5L	C3941A	JPTVOB2337

### External I/O Cable

Cable Description	Length (m)	From/Port	To
Unshielded Detachable Mouse Cable	1.5	Mouse Port / Laptop	Mouse
Unshielded Detachable Printer Cable	1.2	Printer Port / Laptop	Printer
Unshielded Detachable AC Cable	1.0	Modem	Adapter 2
Shielded Detachable RS232 Cable	1.2	Modem	Laptop
Unshielded Undetachable DC Cable	1.6	EUT	Adapter
Unshielded Detachable RJ45 Cable	1.2	EUT	ISN
Unshielded Detachable RJ45 Cable	2.0	Laptop	ISN

### Block Diagram of Test Setup



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## **SUMMARY OF TEST RESULTS**

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<b>FCC Rules</b>	<b>Description of Test</b>	<b>Results</b>
§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

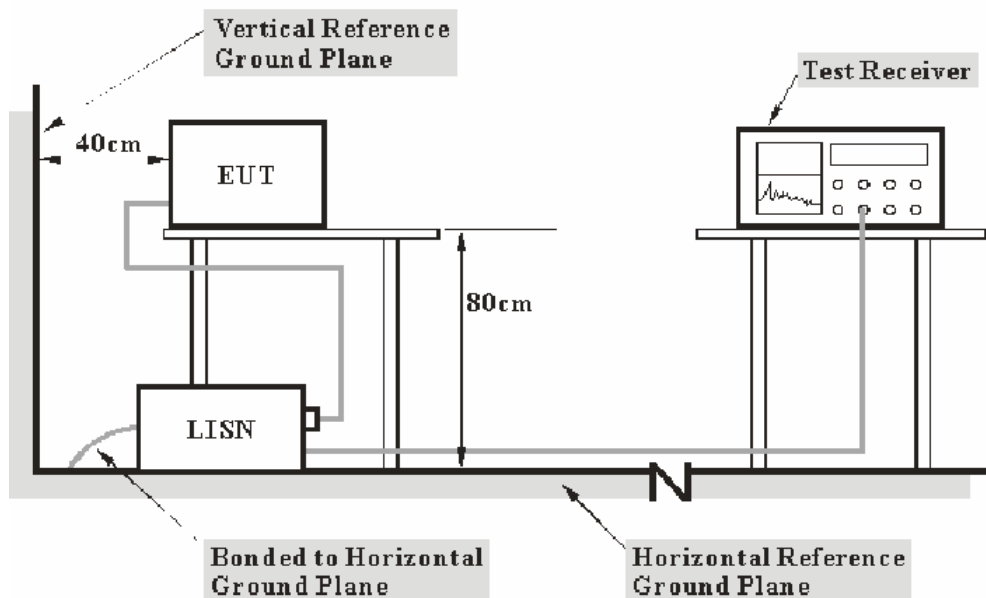
### Measurement Uncertainty

Input quantities to be considered for conducted disturbance measurements 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 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.

### 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	2012-11-24	2013-11-23
Rohde & Schwarz	L.I.S.N.	ENV216	3560.6650.12-101613-Yb	2013-05-07	2014-05-07
BACL	CE Test software	BACL-CE	V1.0	-	-

\* **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) and Cable Loss. The basic equation is as follows:

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

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:

**14.7 dB at 12.649504 MHz** in the **Neutral** 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

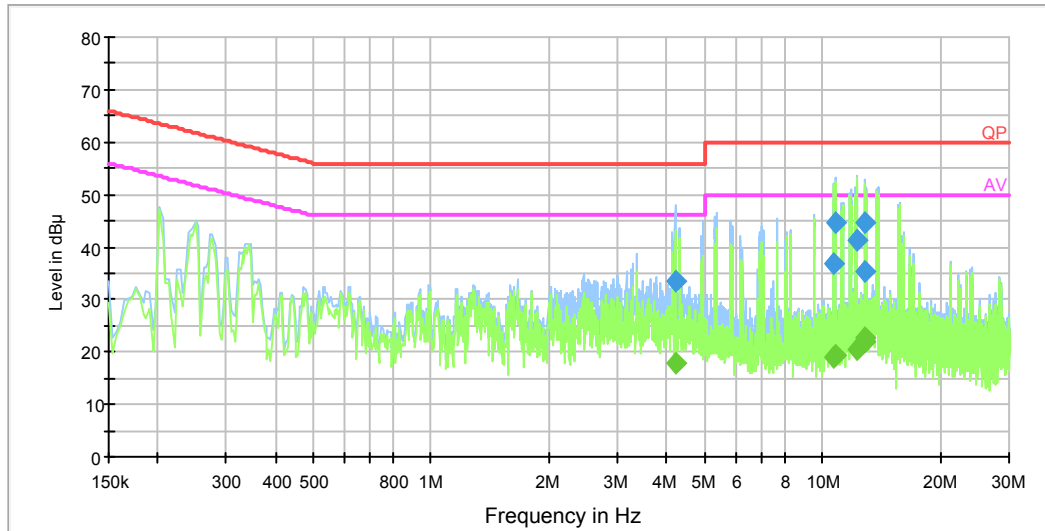
<b>Temperature:</b>	25 °C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.0 kPa

*The testing was performed by Simon Wang on 2013-06-27.*

Test mode: Live video

AC 120V/60 Hz, Line

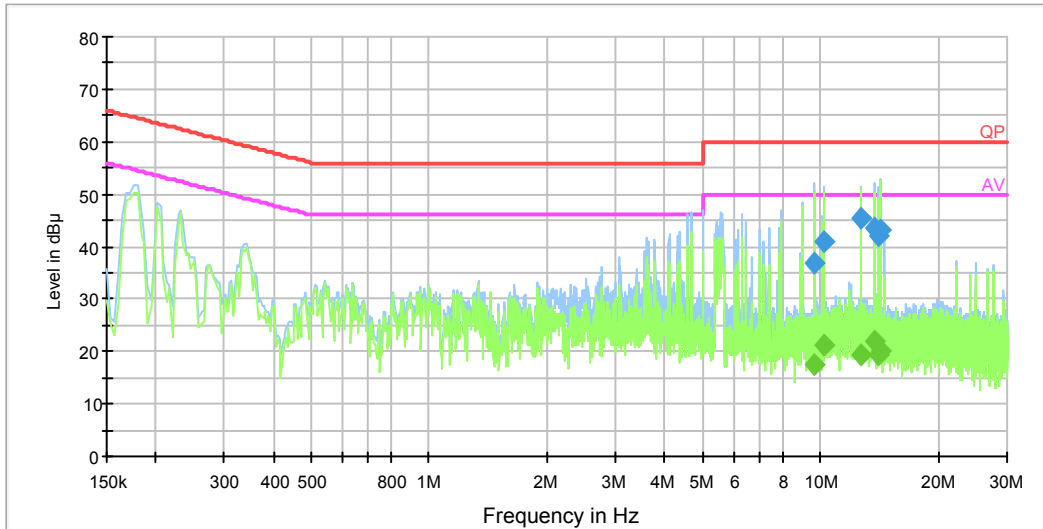
EMI Auto Test L



Frequency (MHz)	Corrected Amplitude (dBµV)	Corrected Factor (dB)	Limit (dBµV)	Margin (dB)	Remark (PK/QP/Ave.)
10.776898	44.6	0.6	60.0	15.4	QP
12.904564	44.6	0.7	60.0	15.4	QP
12.213430	41.4	0.7	60.0	18.6	QP
4.201804	33.4	0.4	56.0	22.6	QP
10.684958	36.7	0.6	60.0	23.3	QP
12.851062	35.4	0.7	60.0	24.6	QP
12.904564	22.8	0.7	50.0	27.2	Ave.
12.851062	22.0	0.7	50.0	28.0	Ave.
4.201804	17.9	0.4	46.0	28.1	Ave.
12.213430	20.4	0.7	50.0	29.6	Ave.
10.776898	19.3	0.6	50.0	30.7	Ave.
10.684958	19.1	0.6	50.0	30.9	Ave.

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

EMI Auto Test L



Frequency (MHz)	Corrected Amplitude (dBµV)	Corrected Factor (dB)	Limit (dBµV)	Margin (dB)	Remark (PK/QP/Ave.)
12.649504	45.3	0.7	60.0	14.7	QP
13.737690	43.6	0.7	60.0	16.4	QP
14.100026	42.1	0.8	60.0	17.9	QP
10.162924	40.8	0.6	60.0	19.2	QP
9.666810	36.9	0.6	60.0	23.1	QP
14.211919	43.2	0.8	60.0	23.1	QP
13.737690	21.8	0.7	50.0	28.2	Ave.
10.162924	21.1	0.6	50.0	28.9	Ave.
14.211919	20.3	0.8	50.0	29.7	Ave.
12.649504	19.4	0.7	50.0	30.6	Ave.
14.100026	19.2	0.8	50.0	30.8	Ave.
9.666810	17.5	0.6	50.0	32.5	Ave.

Note:

1. Corrected Amplitude = Reading + Correction Factor
2. Correction Factor = LISN VDF + Cable Loss  
The corrected factor has been input into the transducer of the test software.
3. Margin = Limit – Corrected Amplitude

## FCC §15.109 - RADIATED SPURIOUS EMISSIONS

### Applicable Standard

FCC §15.109

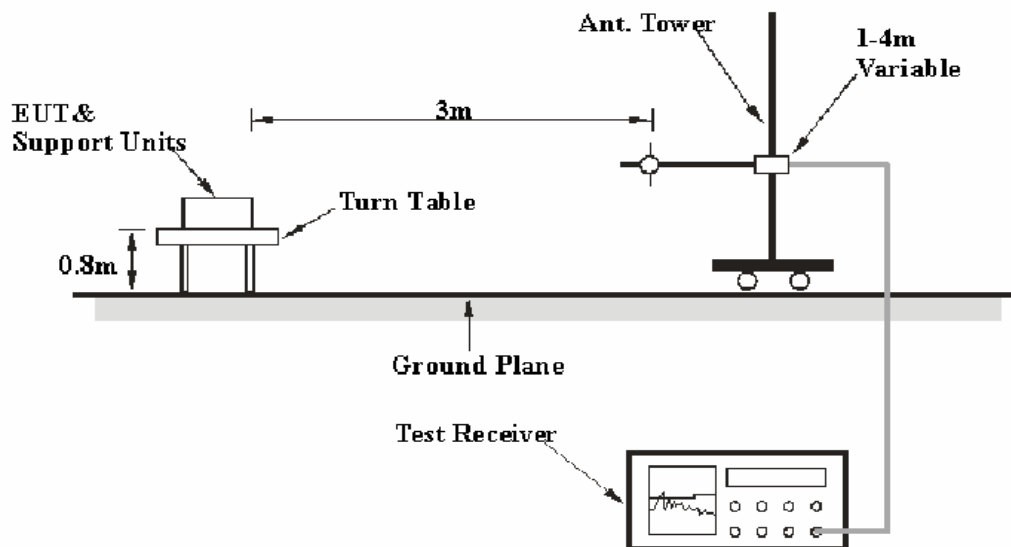
### Measurement Uncertainty

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
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.

### 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	2012-11-24	2013-11-23
Rohde & Schwarz	EMI Test Receiver	ESCI	101122	2013-05-09	2014-05-09
Sunol Sciences	Broadband Antenna	JB1	A040904-2	2011-11-28	2014-11-27
SUPER ULTRA	Amplifier	ZVA-213+	N/A	2012-11-24	2013-11-23
Sunol Sciences	Horn Antenna	DRH-118	A052304	2011-12-01	2014-11-30
Rohde & Schwarz	Signal Analyzer	FSIQ26	8386001028	2012-11-24	2013-11-23
R&S	Auto test Software	EMC32	V6.30	N/A	N/A

\* **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, with the worst margin reading of:

**1.3 dB at 519.731950 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

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

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

## Test Data

### Environmental Conditions

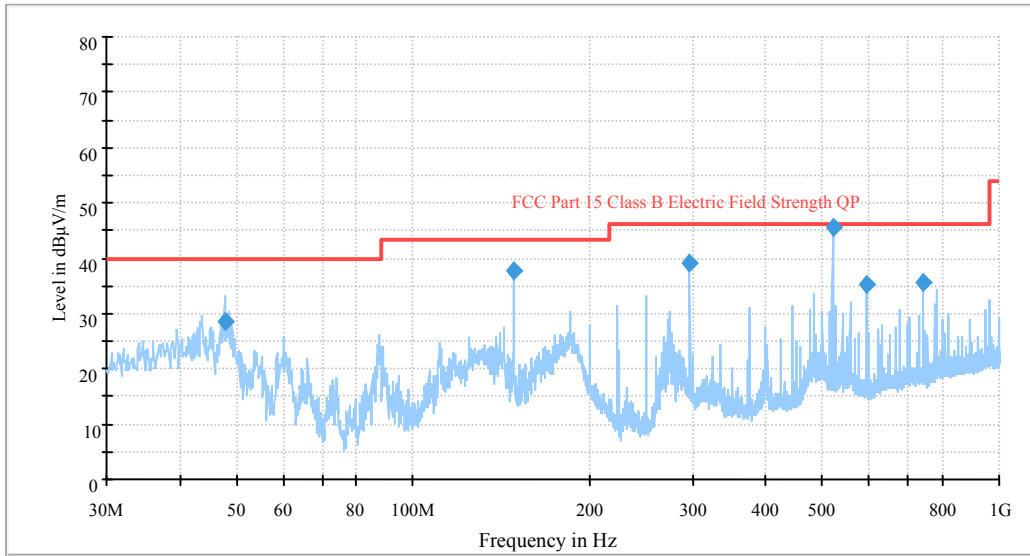
<b>Temperature:</b>	25°C
<b>Relative Humidity:</b>	56 %
<b>ATM Pressure:</b>	100.0 kPa

*The testing was performed by Simon Wang on 2013-06-27.*

*Test mode: Live video*

1)30 MHz -1 GHz:

Auto Test (FCC part 15 Class B)



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity	Turntable Position (Degree)	Correction Factor (dB/m)	Limit (dBµV/m)	Margin (dB)
519.731950	44.7	104.0	V	304.0	-10.0	46.0	1.3*
148.490800	37.8	104.0	V	128.0	-14.9	43.5	5.7
296.993850	39.0	106.0	H	82.0	-14.1	46.0	7.0
742.586250	35.7	110.0	V	112.0	-6.5	46.0	10.3
593.996200	35.2	105.0	V	173.0	-9.4	46.0	10.8
47.795850	28.6	128.0	V	353.0	-19.2	40.0	11.4

## 2) Above 1 GHz:

Frequency (MHz)	Receiver		Turntable Degree	Rx Antenna		Corrected Factor (dB)	Corrected Amplitude (dB $\mu$ V/m)	FCC Part 15B, Class B	
	Reading (dB $\mu$ V)	Detector (PK/QP/Ave.)		Height (m)	Polar (H/V)			Limit (dB $\mu$ V/m)	Margin (dB)
1825.6	42.82	Ave.	196	1.2	V	2.63	45.45	54	8.55
1638.1	38.34	Ave.	89	1.3	V	1.77	40.11	54	13.89
1128.5	40.11	Ave.	27	1.2	H	-0.58	39.53	54	14.47
1580.3	37.57	Ave.	123	1.1	H	1.7	39.27	54	14.73
1825.6	52.51	PK	196	1.2	V	2.63	55.14	74	18.86
1128.5	55.25	PK	27	1.2	H	-0.58	54.67	74	19.33
1638.1	52.35	PK	89	1.3	V	1.77	54.12	74	19.88
1580.3	51.38	PK	123	1.1	H	1.7	53.08	74	20.92

## 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
- 4) \*Within measurement uncertainty



## **DECLARATION LETTER**

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2013-7-15

### **Product Similarity Declaration**

To Whom It May Concern,

We, ShenZhen Foscam Intelligent Technology Co.,Ltd. hereby declare that our IP Camera, Model Number: FI9804W ,HD953W,HD951W,FC5511W,FC5411W are electrically identical with FI9805W 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



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