

Application for FCC Certification  
On behalf of

Zhejiang Dahua Vision Technology Co., Ltd.

Product Name	Model No.
CPE	DH-PFM881

FCC ID: SVNDH-PFM881

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Report No. : ACI-F14144A1  
Date of Test : Sep. 18, 2014  
Date of Report : Oct. 22, 2014

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### TEST REPORT FOR FCC CERTIFICATE

Applicant : Zhejiang Dahua Vision Technology Co., Ltd.

Manufacturer : Zhejiang Dahua Vision Technology Co., Ltd.

EUT Description :

EUT	Model No.
CPE	DH-PFM881

Power Supply : DC 24V (POE Power)

Test Voltage : AC 120V/60Hz (to POE adapter)

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART C OCTOBER 2014  
AND ANSI C63.4-2003*

The device described above is tested by Audix Technology (Shanghai) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report also shows that the EUT (M/N: DH-PFM881), which was tested on Sep. 18, 2014 is technically compliance with the FCC limits.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

***The test results for EUT's other function are contained in No. ACI-F14148, a FCC Verification report.***

Date of Test :                     Sep. 18, 2014                     Date of Report :                     Sep. 22, 2014                    

Producer :                     Kathy Wang                      
KATHY WANG / Supervisor

Review :                     Dio Yang                      
DIO YANG / Deputy Manager

**AUDIX**<sup>®</sup> For and on behalf of  
Audix Technology (Shanghai) Co., Ltd.

Signatory :                     Sammy Chen                      
Authorized Signature EMC SAMMY CHEN / Deputy Manager

# 1 SUMMARY OF STANDARDS AND RESULTS

## 1.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Description / Test Item	Test Standard	Results	Meets Limit
<b>EMISSION</b>			
Conducted Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2014 AND ANSI C63.4:2009 AND KDB789033 D02 v01	Pass	15.207
Radiated Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2014 AND ANSI C63.4:2009 AND KDB789033 D02 v01	Pass	15.209 (a) 15.205 (a)
6 dB Bandwidth Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2014 AND ANSI C63.4:2009 AND KDB789033 D02 v01	Pass	15.407 (e)
Maximum Conducted Output Power Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2014 AND ANSI C63.4:2009 AND KDB789033 D02 v01 AND KDB662911	Pass	15.407 (a)(3)
Power Spectral Density Measurement	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2014 AND ANSI C63.4:2009 AND KDB789033 D02 v01 AND KDB662911	Pass	15.407 (a)(3)
Undesirable Emission	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2014 AND ANSI C63.4:2009 AND KDB789033 D02 v01 AND KDB662911	Pass	15.407 (b)(4)
Frequency Stability	FCC RULES AND REGULATIONS PART 15 SUBPART C October 2014 AND ANSI C63.4:2009 AND KDB789033 D02 v01	Pass	15.407 (g)

## 2 GENERAL INFORMATION

### 2.1 Description of Equipment Under Test

Description :

EUT	Model Number
CPE	DH-PFM881

Type of EUT :  Production  Pre-product  Pro-type

Note #1 : The modified histories of report are as follows:

Report No.	Model No.	Rev. Summary	Edition No.	Data of Rev.
ACI-F14144	DH-PFM880	Original Report.	0	Sep 22, 2014
ACI-F14144A1	DH-PFM881	To add a new model (DH-PFM881)	Rev. A1	Oct 22, 2014

Note #2 : The DH-PFM880 and DH-PFM881 are all the same except for different enclosure and antenna. ( DH-PFM880 using metal enclosure and external antenna, DH-PFM881 using plastic enclosure and built-in antenna.)

Thus, the new added model DH-PFM881 was performed on the Radiated Emission Test additionally while the original model DH-PFM880 was performed full tests.

Radio Tech : IEEE 802.11a/n HT20, HT40

Freq. Band : 5.8GHz band:  
For 802.11a & 802.11n HT20:  
5745MHz (Ch149), 5765MHz (Ch153),  
5785MHz (Ch157), 5805MHz (Ch161),  
5825MHz (Ch165)  
For 802.11n HT40:  
5755MHz (Ch151), 5795MHz (Ch159)

Tested Freq. : For 802.11a & 802.11n HT20:  
5745MHz (Ch149), 5785MHz (Ch157),  
5825MHz (Ch165)  
For 802.11n HT40:  
5755MHz (Ch151), 5795MHz (Ch159)

Modulation : OFDM


Transmit : 802.11a:  
data rate : 6, 9, 12, 24, 36, 48, 54 Mbps  
802.11n HT20:  
(MCS0-MCS7) 6.5, 13, 19.5, 26, 39, 52, 58.5, 65Mbps

After testing, the highest peak output power of the EUT was at **6 Mbps** in 802.11a mode, **6.5 Mbps (MCS0)** in 802.11n HT20 mode.

So data rate mentioned above were representative selected to test in this report.

Test Mode : The EUT was set at TX100 test mode through test program “art” during all the test in the report, which means continuous TX with duty cycle 100%.

Antenna Gain : 15 dBi

POE Adapter : Manufacturer : Dahua  
Model Number : GRT-240050  
Input : AC100~240V 50/60Hz  
Output : DC24V  500mA

Applicant : Zhejiang Dahua Vision Technology Co., Ltd.  
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Manufacturer : Zhejiang Dahua Vision Technology Co., Ltd.  
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Hangzhou, P.R. China.

## 2.2 Description of Test Facility

Site Description (Semi-Anechoic Chamber)	: Sept. 17, 1998 file on Mar 16, 2012 Renewed Federal Communications Commission FCC Engineering Laboratory 7435 Oakland Mills Road Columbia, MD 21046, USA
Name of Firm	: Audix Technology (Shanghai) Co., Ltd.
Site Location	: 3 F 34 Bldg 680 Guiping Rd., Caohejing Hi-Tech Park, Shanghai 200233, China
FCC registration Number	: 91789
Accredited by NVLAP, Lab Code	: 200371-0

## 2.3 Measurement Uncertainty

Radiated Emission Expanded Uncertainty (30-200MHz):	U = 4.40dB (Horizontal) U = 4.40dB (Vertical)
Radiated Emission Expanded Uncertainty (200M-1GHz):	U = 4.40dB (Horizontal) U = 5.44dB (Vertical)
Radiated Emission Expanded Uncertainty (Above 1GHz):	U= 5.08 dB (1-6GHz) U= 5.24 dB (> 6GHz)

### 3 RADIATED EMISSION TEST

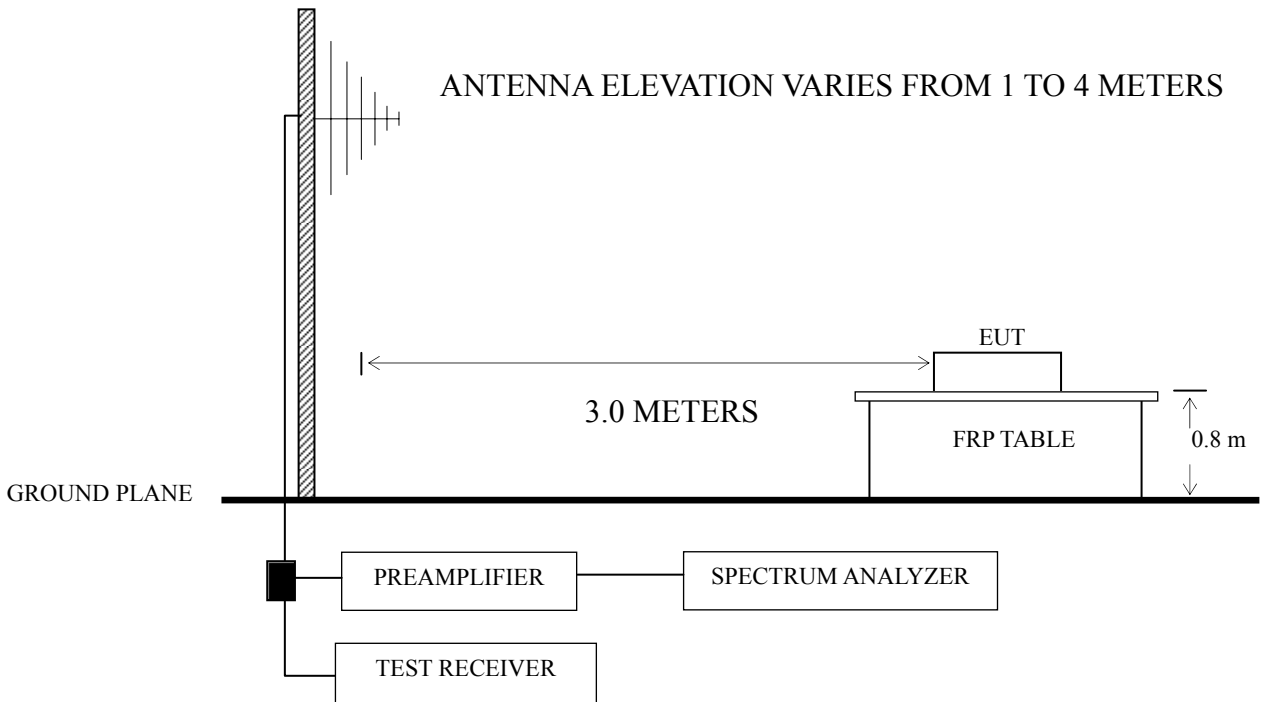
#### 3.1 Test Equipment

The following test equipment are used during the radiated emission test in a semi-anechoic chamber:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Pre-Amplifier	Agilent	8447D	2944A10548	Sep 18, 2014	Mar 17, 2015
2.	Pre-Amplifier	Agilent	8449B	3008A00864	Mar 20, 2014	Mar 19, 2015
3.	Spectrum Analyzer	Agilent	N9010A	MY52221182	Jun 14, 2014	Jun 13, 2015
4.	Test Receiver	R&S	ESCI	101302	Sep 03, 2014	Sep 02, 2015
5.	Bi-log Antenna	TESEQ	CBL6112D	23193	May 03, 2014	May 02, 2015
6.	Horn Antenna	EMCO	3115	9607-4878	Jun 16, 2014	Jun 15, 2015
7.	Horn Antenna	EMCO	3116	00062643	Jul 21, 2014	Jul 21, 2015
8.	50 $\Omega$ Coaxial Switch	Anritsu	MP59B	6200426390	Sep 18, 2014	Mar 17, 2015
9.	50 $\Omega$ Terminator	Audix	BNC	001	Mar 20, 2014	Mar 19, 2015
10.	50 $\Omega$ Terminator	Audix	BNC	002	Mar 20, 2014	Mar 19, 2015
11.	Software	Audix	E3	SET00200 9912M295-2	--	--



### 3.2 Block Diagram of Test Setup



■ : 50 ohm Coaxial Switch

### 3.3 Radiated Emission Limit [FCC Part 15 Subpart C 15.209]

Frequency (MHz)	Distance (m)	Field strength limits ( $\mu\text{V/m}$ )	
		( $\mu\text{V/m}$ )	dB( $\mu\text{V/m}$ )
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0

NOTE 1 - Emission Level dB ( $\mu\text{V/m}$ ) = 20 log Emission Level ( $\mu\text{V/m}$ )  
 NOTE 2 - The tighter limit applies at the band edges.  
 NOTE 3 - Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.  
 NOTE 4 - The limits shown are based on Quasi-peak value detector below or equal to 1GHz and Average value detector above 1GHz.  
 NOTE 5 - Above 1 GHz, the limit on peak emission is 20 dB above the maximum permitted average emission limit applicable to the EUT

### 3.4 Test Configuration

The EUT (listed in Sec.2.1) and the simulators (listed in Sec.2.2) were installed as shown on Sec.3.2 to meet FCC requirements and operating in a manner that tends to maximize its emission level in a normal application.

### 3.5 Operating Condition of EUT

3.5.1 Setup the EUT as shown in Sec. 3.2.

3.5.2 Turn on the power of all equipment.

3.5.3 Turn the EUT on the test mode, and then test.

### 3.6 Test Procedures

The EUT was placed on a turntable that is 0.8 meter above ground. The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (Calibrated Bilog Antenna) or Horn antenna was used as receiving antenna. Both horizontal and vertical polarizations of the antenna were set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to ANSI C63.4:2003 requirements during radiated emission test.

The bandwidth of Test Receiver R&S ESCI was set at 120 kHz from 30MHz to 1000MHz and The Spectrum Agilent N9010A was set at 1MHz above 1GHz.

The frequency range from 30 MHz to 40 GHz was checked.

### 3.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

Test Model	Memo	Data Page
DH-PFM881	emissions < 1GHz	P13
DH-PFM881	Cabinet emission > 1GHz	P14

NOTE 1 – Level = Read Level + Antenna Factor + Cable Loss (<1GHz)

NOTE 2 – Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor (>1GHz)

NOTE 3 – EUT configured in Lying, Side & Stand direction were all evaluated. The emission levels recorded below is data of EUT configured in **Stand** direction, for Stand direction was the maximum emission direction during the test.

NOTE 4 – All reading are Quasi-Peak values below or equal to 1GHz, Peak and Average values above 1GHz.

For above 1GHz test, if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.

**Worst case emission < 1GHz**

EUT : \_\_\_\_\_ CPE \_\_\_\_\_ Temperature : \_\_\_\_\_ 25°C \_\_\_\_\_  
 Model No. : \_\_\_\_\_ DH-PFM881 \_\_\_\_\_ Humidity : \_\_\_\_\_ 45%RH \_\_\_\_\_  
 Test Mode : \_\_\_\_\_ Transmitting \_\_\_\_\_ Date of Test : \_\_\_\_\_ Sep 18, 2014 \_\_\_\_\_

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	30.97	5.15	18.27	0.54	23.96	40.00	16.04	QP
	93.05	13.42	8.97	0.96	23.35	43.50	20.15	
	109.54	8.68	12.33	1.04	22.05	43.50	21.45	
	255.04	13.92	11.90	1.64	27.46	46.00	18.54	
	319.06	20.80	14.49	1.84	37.13	46.00	8.87	
	<b>801.15</b>	<b>18.00</b>	<b>20.70</b>	<b>2.89</b>	<b>41.59</b>	<b>46.00</b>	<b>4.41</b>	
Vertical	30.97	15.86	18.27	0.54	34.67	40.00	5.33	QP
	51.34	14.74	7.17	0.69	22.60	40.00	17.40	
	117.30	20.40	12.15	1.09	33.64	43.50	9.86	
	202.66	18.81	8.20	1.42	28.43	43.50	15.07	
	320.03	12.75	14.70	1.84	29.29	46.00	16.71	
	<b>800.00</b>	<b>21.60</b>	<b>20.70</b>	<b>2.87</b>	<b>45.17</b>	<b>46.00</b>	<b>0.83</b>	

TEST ENGINEER: WENCY YANG

## Cabinet Emissions > 1GHz

For the cabinet-emission measurements, the antenna was replaced by a termination matching the 50Ω impedance of the antenna

EUT : \_\_\_\_\_ CPE \_\_\_\_\_ Temperature : \_\_\_\_\_ 25°C \_\_\_\_\_  
 Model No. : \_\_\_\_\_ DH-PFM881 \_\_\_\_\_ Humidity : \_\_\_\_\_ 45%RH \_\_\_\_\_  
 Test Mode : \_\_\_\_\_ Transmitting \_\_\_\_\_ Date of Test : \_\_\_\_\_ Sep 18, 2014 \_\_\_\_\_

Polarization	Frequency (MHz)	Meter Reading dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	2003.00	54.46	27.40	4.55	35.30	51.11	74.00	22.89	Peak
	5182.00	45.51	34.04	8.05	34.94	52.66	74.00	21.34	Peak
	<b>5725.00</b>	<b>46.72</b>	<b>34.70</b>	<b>8.42</b>	<b>35.05</b>	<b>54.79</b>	<b>74.00</b>	<b>19.21</b>	<b>Peak</b>
	<b>5725.00</b>	<b>33.01</b>	<b>34.70</b>	<b>8.42</b>	<b>35.05</b>	<b>41.08</b>	<b>54.00</b>	<b>12.92</b>	<b>Average</b>
	<b>5850.00</b>	<b>33.52</b>	<b>34.70</b>	<b>8.53</b>	<b>35.07</b>	<b>41.68</b>	<b>54.00</b>	<b>12.32</b>	<b>Average</b>
	<b>5850.00</b>	<b>46.66</b>	<b>34.70</b>	<b>8.53</b>	<b>35.07</b>	<b>54.82</b>	<b>74.00</b>	<b>19.18</b>	<b>Peak</b>
	11472.00	38.43	39.46	13.43	35.60	55.72	74.00	18.28	Peak
	11472.00	22.37	39.46	13.43	35.60	39.66	54.00	14.34	Average
Vertical	5129.00	44.01	33.95	8.00	34.93	51.03	74.00	22.97	Peak
	<b>5725.00</b>	<b>46.23</b>	<b>34.70</b>	<b>8.42</b>	<b>35.05</b>	<b>54.30</b>	<b>74.00</b>	<b>19.70</b>	<b>Peak</b>
	<b>5725.00</b>	<b>32.81</b>	<b>34.70</b>	<b>8.42</b>	<b>35.05</b>	<b>40.88</b>	<b>54.00</b>	<b>13.12</b>	<b>Average</b>
	<b>5850.00</b>	<b>48.35</b>	<b>34.70</b>	<b>8.53</b>	<b>35.07</b>	<b>56.51</b>	<b>74.00</b>	<b>17.49</b>	<b>Peak</b>
	<b>5850.00</b>	<b>35.69</b>	<b>34.70</b>	<b>8.53</b>	<b>35.07</b>	<b>43.85</b>	<b>54.00</b>	<b>10.15</b>	<b>Average</b>
	11472.00	39.03	39.46	13.43	35.60	56.32	74.00	17.68	Peak
	11472.00	24.15	39.46	13.43	35.60	41.44	74.00	32.56	Peak
	17235.00	31.00	42.50	16.19	35.49	54.20	74.00	19.80	Peak
17235.00	17.28	42.50	16.19	35.49	40.48	54.00	13.52	Average	

TEST ENGINEER: WENCY YANG

## **4 DEVIATION TO TEST SPECIFICATIONS**

None.