



# SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

Report No.: SHEM190201083501  
Page: 1 of 26

## Test Report

**Application No.:** SHEM1902010835AT  
**Applicant:** Zhejiang Dahua Vision Technology Co., Ltd.  
**Address of Applicant:** No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China  
**Manufacturer:** Zhejiang Dahua Vision Technology Co., Ltd.  
**Address of Manufacturer:** No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China  
**Product Information:**  
**EUT Name:** IP Camera  
**Model:** Refer to page 2  
**Standard(s) :** 47 CFR PART 15, Subpart B  
**Date of Receipt:** 2017-06-14  
**Date of Test:** 2017-06-15 to 2017-07-05  
**Date of Issue:** 2019-02-18

<b>Test Result :</b>	<b>PASS*</b>
----------------------	--------------

\* In the configuration tested, the EUT complied with the standards specified above.

Parlan Zhan

Parlan Zhan  
E&E Section Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



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**Model No.:**

DH-IPC-HDW5831RP-Z, DH-IPC-HDW5231RP-Z, DH-IPC-HDW5231RP-ZE-27135, DH-IPC-HDW5231RP-ZE, DH-IPC-HDW5231RN-ZE-27135, DH-IPC-HDW5231RN-ZE, IPC-HDW5231RP-ZE-27135, IPC-HDW5231RP-ZE, IPC-HDW5231RN-ZE-27135, IPC-HDW5231RN-ZE, DH-IPC-HDW5431RP-ZE-27135, DH-IPC-HDW5431RP-ZE, DH-IPC-HDW5431RN-ZE-27135, DH-IPC-HDW5431RN-ZE, IPC-HDW5431RP-ZE-27135, IPC-HDW5431RP-ZE, IPC-HDW5431RN-ZE-27135, IPC-HDW5431RN-ZE, DH-IPC-HDW5631RP-ZE-27135, DH-IPC-HDW5631RP-ZE, DH-IPC-HDW5631RN-ZE-27135, DH-IPC-HDW5631RN-ZE, IPC-HDW5631RP-ZE-27135, IPC-HDW5631RP-ZE, IPC-HDW5631RN-ZE-27135, IPC-HDW5631RN-ZE, DH-IPC-HDW5831RP-ZE-2712, DH-IPC-HDW5831RP-ZE, DH-IPC-HDW5831RN-ZE-2712, DH-IPC-HDW5831RN-ZE, IPC-HDW5831RP-ZE-2712, IPC-HDW5831RP-ZE, IPC-HDW5831RN-ZE-2712, IPC-HDW5831RN-ZE

**Add Model No.:**

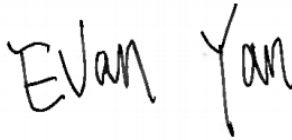

IPC-HDW2430RP-ZS; IPC-HDW2430RN-ZS; IPC-HDW2230RP-ZS; IPC-HDW2230RN-ZS; IPC-HDW2230RP-L-ZS; IPC-HDW2230RN-L-ZS;N85CM5Z; DH-IPC-HDW2430RP-ZS; DH-IPC-HDW2430RN-ZS; DH-IPC-HDW2230RP-ZS; DH-IPC-HDW2230RN-ZS; DH-IPC-HDW2230RP-L-ZS; DH-IPC-HDW2230RN-L-ZS

**Add Model No.:**

DH-IPC-HDW4231TP-Z-S4, DH-IPC-HDW4231TN-Z-S4, DH-IPC-HDW4431TP-Z-S4, DH-IPC-HDW4431TN-Z-S4



Revision Record			
Version	Description	Date	Remark
00	Add Models	2019-02-18	Based on SHEM170600370401(HKEM170700090901)

Authorized for issue by:				
				
		<hr/> Evan Yan /Project Engineer		
				
		<hr/> Bruce Tang /Reviewer		



## 2 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Conducted Emission (150kHz to 30MHz)	47 CFR PART 15, Subpart B	ANSI C63.4:2014	Class B	PASS
Radiated Emission (30MHz to 1GHz)	47 CFR PART 15, Subpart B	ANSI C63.4:2014	Class B	PASS
Radiated Emission above 1 GHz	47 CFR PART 15, Subpart B	ANSI C63.4:2014	Class B	PASS

**Note1: Declaration of EUT Family Grouping:**

There are series models mentioned in this report and they are the similar in electrical and electronic characters. Only the model DH-IPC-HDW5831RP-Z was tested since their differences are pixels and sales area.

**Note2:** We add some models (refer to page 2) in this report. The new models added in this report are the same Electronic or Electrical characters as the models in the report SHEM170600370401 (HKEM170700090901), so the new models in this report are deemed to fulfil the EMC requirements without testing.

**Note3:** We add some models (refer to page 2) in this report. The new models added in this report are the same Electronic or Electrical characters as the models in the report SHEM180800666101, so the new models in this report are deemed to fulfill the EMC requirements without testing.



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## 4 General Information

### 4.1 Details of EUT

Power Supply: DC12V or PoE  
Power Cord: --  
Operating frequency: 816MHz((the Highest working frequency )  
Cable Type: about 0.4m for signal cable

### 4.2 Description of Support Units

Supporting equipment :

Description	Manufacturer	Model No.	Serial No.	Data Cable	Power Cable
Personal Computer	DELL	OPTIPLEX 755	E191 (reference no.)	N/A	1.5m
Monitor	DELL	SP2208WFPt	DT09068168FB	VGA	1.5m
Printer	Hewett Packard	C3990A	JPZT098822	LPT	1.5m
Universal Programmer	Qian LongSheng	QL-2006	201105116086	COM/USB <sup>1)</sup>	1.5m (DC)
Keyboard	Lenovo	KB1021	0000319	USB <sup>2)</sup>	N/A
Mouse	Lenovo	MO28UOL	4401282 081	USB <sup>3)</sup>	N/A
Ethernet router	Net Screen	NS-5GT-103	0064022004002 202	LAN	1.8m (DC)

Note: For the cable detail please refer to below table.



**Cables:**

#	Type	Length, m	Shield	Metallic hood	Ferrite
1	VGA	1.8	Yes	No	Yes
2	LPT	1.8	Yes	No	No
3	COM	1.5	Yes	No	No
4	USB <sup>1)</sup>	1.5	Yes	No	No
5	USB <sup>2)</sup>	1.8	Yes	No	No
6	USB <sup>3)</sup>	1.8	Yes	No	No

**Software:**

Description	Manufacturer	Software name	Version no.
EMC test software	Microsoft	Internet Explorer	11.0.9600.18204

### 4.3 Standards Applicable for Testing

CFR 47, FCC Part 15, 2016

ANSI C63.4:2014

### 4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

No tests were sub-contracted.

### 4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• **NVLAP (Certificate No. 201034-0)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the National Voluntary Laboratory Accreditation Program(NVLAP). Certificate No. 201034-0.

• **FCC –Designation Number: CN5033**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

Designation Number: CN5033. Test Firm Registration Number: 479755.

• **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A-1.

• **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868,C-14336,T-12221,G-10830 respectively.



#### 4.6 Deviation from Standards

None.

#### 4.7 Abnormalities from Standard Conditions

None.

#### 4.8 Abbreviations

N/A: Not Applicable

EUT: Equipment Under Test

#### 4.9 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radiated disturbance 30MHz – 1GHz	5.5
2	Conducted Emissions	3.1





## 5 Equipments Used during Test

Conducted Emission				
Equipment	Manufacturer	Model / Serial No.	Cal. Date	Cal. Due Date
Test Receiver	Rohde & Schwarz	ESCS 30 /100388	2016/09/28	2017/09/27
Impulse Limiter	Rohde & Schwarz	ESH-3-Z2 / 375881052	2017/01/23	2018/01/22
Artificial Mains Network (LISN)	Schwarzbeck	NSLK 8127 / 8127312	2016/09/27	2017/09/26

Radiated Emission				
Equipment	Manufacturer	Model / Serial No.	Cal. Date	Cal. Due Date
3m Semi-Anechoic Chamber (pre-test)	--	--	--	--
3m / 10m Open Area Test Site	--	--	2015/03/11	2018/03/10
Test Receiver 9KHz-2750MHz	Rohde & Schwarz	ESCS 30 /100388	2016/09/28	2017/09/27
Spectrum Analyzer 9kHz - 30GHz	Rohde & Schwarz	FSP30/101474	2017/06/05	2018/06/04
Loop Antenna 9KHz-30MHz	Rohde & Schwarz	HFH2-Z2	2016/01/23	2019/01/22
Antenna (30-300 MHz)	Schwarzbeck	BBA9106, VHA9103	2014/11/15	2017/11/14
Log-periodic Antennas 300MHz-1000MHz	Schwarzbeck	UHALP9107	2014/11/15	2017/11/14
Antenna, 30MHz – 1000MHz	Schaffner	CBL6111C / 2791	2016/10/19	2018/10/18
Horn Antenna 1 - 18GHz	Schwarzbeck	BBHA9120D/9120D-1070	2016/01/23	2018/01/22
Preamplifier 1 - 18GHz	Schwarzbeck	BBV9718/9718-223	2017/01/23	2018/01/22
Coaxial Cable	--	E167	2016/11/17	2017/11/16
Antenna Mast System	Schwarzbeck	AM9104 / -	--	--
Turntable with Controller	Drehtisch	DT312 / -	--	--



## 6 Test Results

### 6.1 Conducted Emissions Mains Terminals, 150kHz to 30MHz

Test Requirement: FCC Part15 B  
Test Method: ANSI C63.4:2014  
Test Voltage & frequency: 120V AC, 60Hz  
Test Date: 2017-06-15  
Frequency Range: 150KHz to 30MHz  
Class / Severity: Class B  
Detector: Peak for pre-scan (9kHz Resolution Bandwidth)  
Quasi-Peak and Average if maximised peak within 20dB of Quasi-Peak limit

Limit:

Frequency range MHz	Class B Limits dB (µV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
<b>Note:</b> 1) The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz. 2) The lower limit is applicable at the transition frequency.		

#### 6.1.1 EUT Operation

Operating Environment:

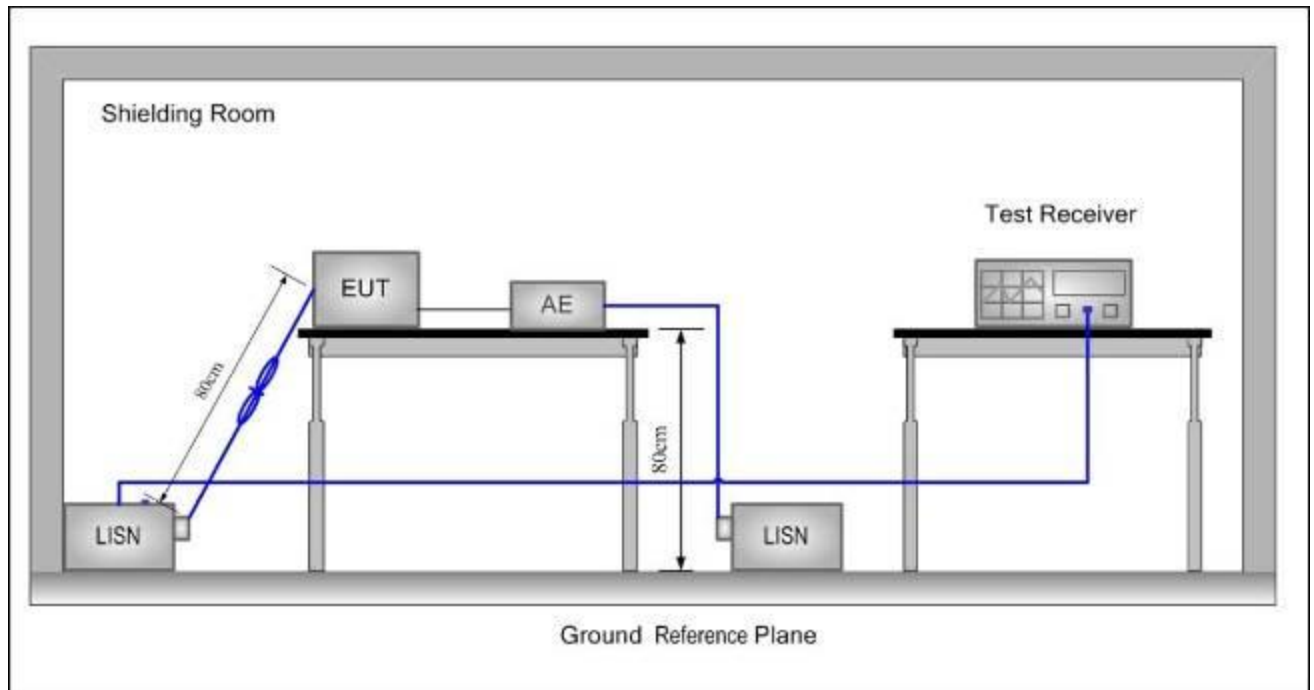
Temperature:  
25°C

Humidity: 47%

Atmospheric Pressure: 1020mbar

EUT Operation: Pre-test with Peak detector with the following mode(s):  
1. DC12V monitoring mode: The EUT powered by DC12V and keep monitoring continual.  
2. PoE monitoring mode: The EUT powered by PoE and keep monitoring continual.  
Final test with Quasi-Peak and Average detector with the following mode(s):  
1. DC12V monitoring mode: The EUT powered by DC12V and keep monitoring continual.  
2. PoE monitoring mode: The EUT powered by PoE and keep monitoring continual.

### 6.1.2 Test Setup and Procedure



1. The mains terminal conducted emission test was conducted in a shielded room.
2. The EUT was connected via the host computer to AC power source through a LISN (Line Impedance Stabilization Network) which provides a  $50\Omega/50\mu\text{H} + 5\Omega$  linear impedance. For Load terminal voltage measurement, a voltage probe was used on the load terminals. Measurement at control terminals were carried out by means of an impedance stabilization network (ISN). The ISN was bounded to ground.
3. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. The EUT kept a distance of at least 0.8m from any other earthed conducting surface. The Artificial Mains Network was situated at a distance of 0.8m from the EUT. The mains lead of EUT excess 0.8m was folded back and forth parallel to the lead so as to form a horizontal bundle with a length between 0.3m and 0.4m.



### 6.1.3 Measurement Data

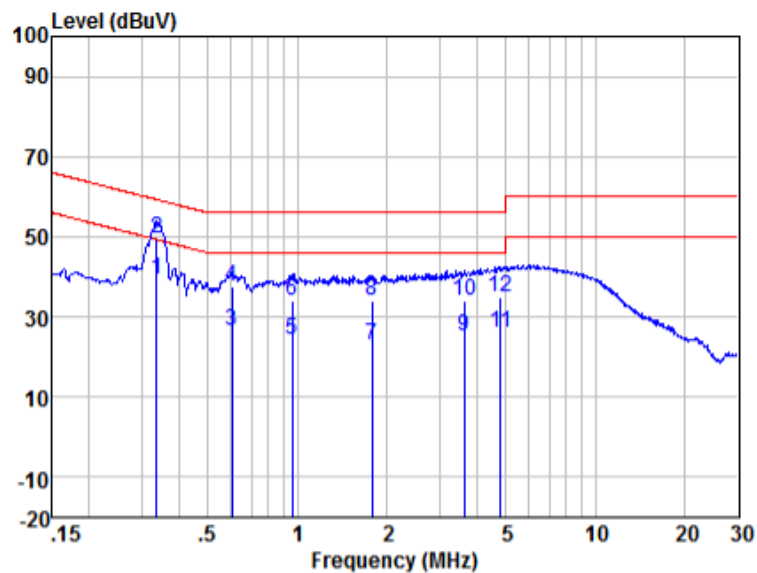
An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

The following Quasi-Peak and Average measurements were performed on DC12V monitoring mode:

Live line:

Peak Scan:



Quasi-peak and Average measurement:

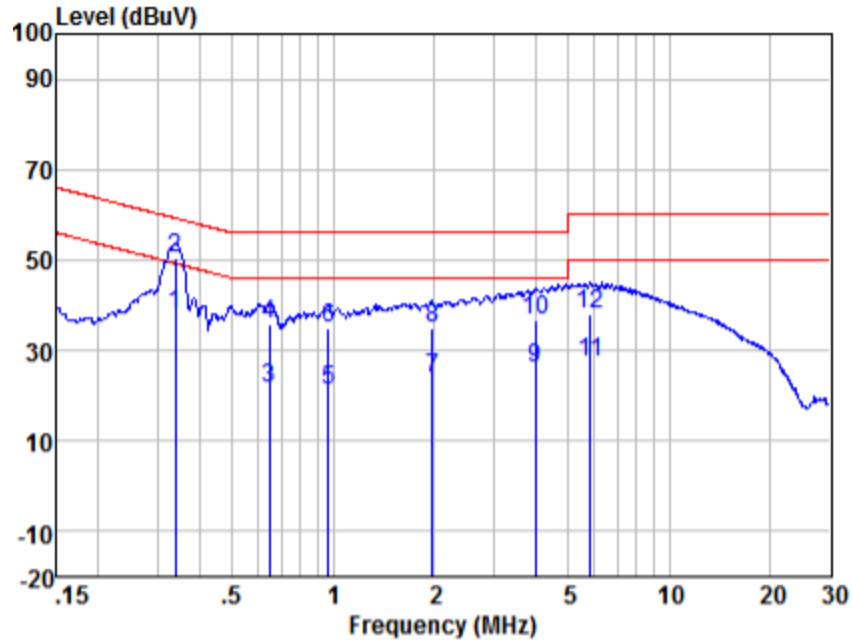
	Freq	Read Level	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.337	39.41	0.10	39.52	49.27	-9.75	Average
2	0.337	49.40	0.10	49.51	59.27	-9.76	QP
3	0.601	26.05	0.10	26.28	46.00	-19.72	Average
4	0.601	37.48	0.10	37.71	56.00	-18.29	QP
5	0.963	23.89	0.10	24.14	46.00	-21.86	Average
6	0.963	33.91	0.10	34.16	56.00	-21.84	QP
7	1.781	22.80	0.10	23.09	46.00	-22.91	Average
8	1.781	33.86	0.10	34.15	56.00	-21.85	QP
9	3.623	24.77	0.10	25.13	46.00	-20.87	Average
10	3.623	33.81	0.10	34.17	56.00	-21.83	QP
11	4.822	25.76	0.10	26.15	46.00	-19.85	Average
12	4.822	34.31	0.10	34.70	56.00	-21.30	QP

Level = Read Level + LISN Factor + Cable Loss.



Neutral line:

Peak Scan:



Quasi-peak and Average measurement:

	Freq	Read Level	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.339	37.95	0.10	38.06	49.22	-11.16	Average
2	0.339	50.19	0.10	50.30	59.22	-8.92	QP
3	0.644	21.49	0.10	21.65	46.00	-24.35	Average
4	0.644	35.81	0.10	35.97	56.00	-20.03	QP
5	0.968	20.92	0.10	21.16	46.00	-24.84	Average
6	0.968	34.54	0.10	34.78	56.00	-21.22	QP
7	1.970	23.45	0.10	23.75	46.00	-22.25	Average
8	1.970	34.63	0.10	34.93	56.00	-21.07	QP
9	4.006	25.64	0.10	25.93	46.00	-20.07	Average
10	4.006	36.27	0.10	36.56	56.00	-19.44	QP
11	5.836	26.91	0.10	27.30	50.00	-22.70	Average
12	5.836	37.51	0.10	37.90	60.00	-22.10	QP

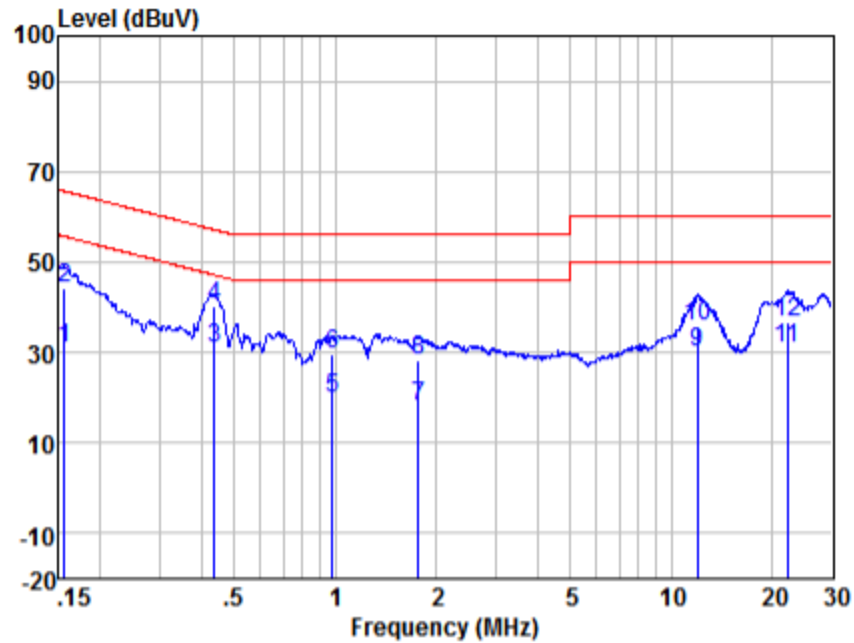
Level = Read Level + LISN Factor + Cable Loss.



PoE monitoring mode:

Live line:

Peak Scan:



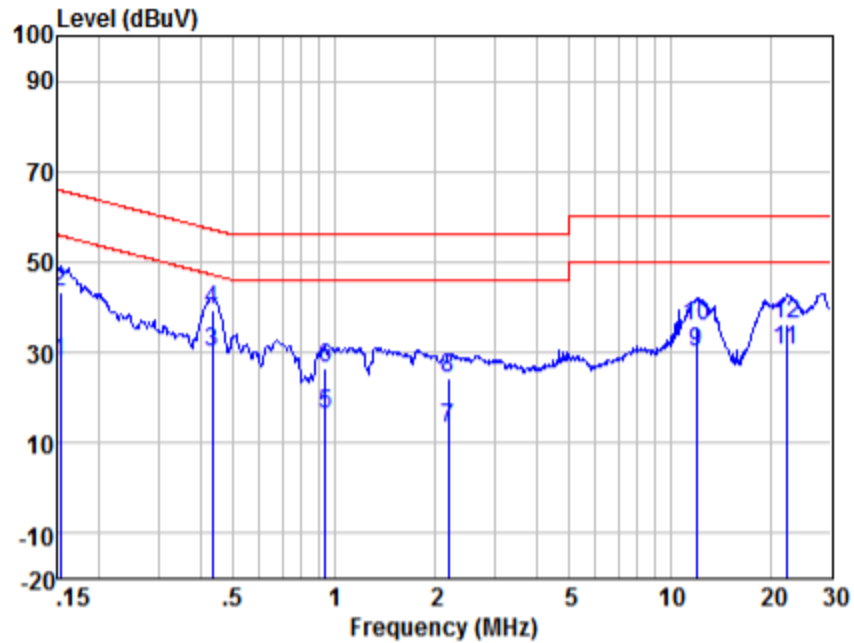
Quasi-peak and Average measurement:

		Read	Cable		Limit	Over	
	Freq	Level	Loss	Level	Line	Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.156	30.48	0.10	30.71	55.65	-24.94	Average
2	0.156	43.77	0.10	44.00	65.65	-21.65	QP
3	0.435	30.57	0.10	30.72	47.15	-16.43	Average
4	0.435	39.93	0.10	40.08	57.15	-17.07	QP
5	0.979	19.41	0.10	19.66	46.00	-26.34	Average
6	0.979	29.37	0.10	29.62	56.00	-26.38	QP
7	1.772	17.78	0.10	18.07	46.00	-27.93	Average
8	1.772	28.11	0.10	28.40	56.00	-27.60	QP
9	11.996	29.77	0.14	30.23	50.00	-19.77	Average
10	11.996	35.41	0.14	35.87	60.00	-24.13	QP
11	22.180	30.17	0.20	30.96	50.00	-19.04	Average
12	22.180	35.91	0.20	36.70	60.00	-23.30	QP

$$\text{Level} = \text{Read Level} + \text{LISN Factor} + \text{Cable Loss.}$$

Neutral line:

Peak Scan:



Quasi-peak and Average measurement:

	Freq	Read Level	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	
1	0.152	27.51	0.10	27.75	55.87	-28.12	Average
2	0.152	43.01	0.10	43.25	65.87	-22.62	QP
3	0.433	29.99	0.10	30.11	47.20	-17.09	Average
4	0.433	39.07	0.10	39.19	57.20	-18.01	QP
5	0.938	15.97	0.10	16.21	46.00	-29.79	Average
6	0.938	26.16	0.10	26.40	56.00	-29.60	QP
7	2.190	13.05	0.10	13.35	46.00	-32.65	Average
8	2.190	24.04	0.10	24.34	56.00	-31.66	QP
9	11.996	29.59	0.14	30.01	50.00	-19.99	Average
10	11.996	35.28	0.14	35.70	60.00	-24.30	QP
11	22.298	29.70	0.20	30.43	50.00	-19.57	Average
12	22.298	35.53	0.20	36.26	60.00	-23.74	QP

Level = Read Level + LISN Factor + Cable Loss.



## 6.2 Radiated Emissions, 30MHz to 1GHz

Test Requirement: FCC Part15 B  
Test Method: ANSI C63.4:2014  
Test Voltage & frequency: 120V AC, 60Hz  
Test Date: 2017-07-05  
Frequency Range: 30MHz to 1GHz  
Measurement Distance: 3m  
Detector: Peak for pre-scan (120kHz resolution bandwidth)  
Quasi-Peak if maximised peak within 20dB of limit  
Class: Class B

Frequency range MHz	Quasi-peak limits dB (µV/m)
30 to 88	40
88 to 216	43.5
216 to 960	46
Above 960	54
Note: At transitional frequencies the lower limit applies.	

### 6.2.1 EUT Operation

Operating Environment:

Temperature: 25°C

Humidity: 47%

Atmospheric Pressure: 1020mbar

EUT Operation: Pre-test with Peak detector with the following mode(s):

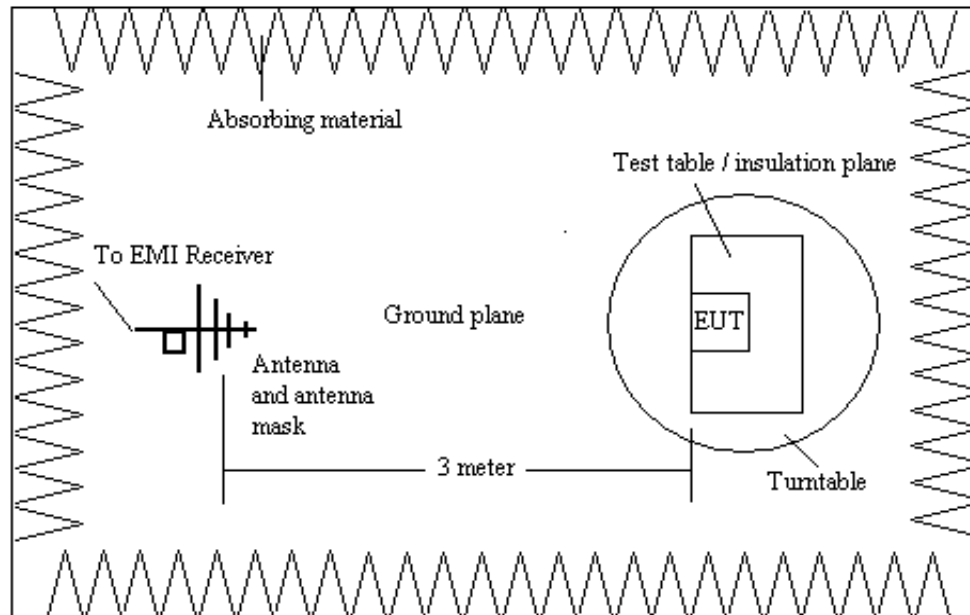
1. DC12V monitoring mode: The EUT powered by DC12V and keep monitoring continual.
2. PoE monitoring mode: The EUT powered by PoE and keep monitoring continual.

Final test with Quasi-Peak and Average detector with the following mode(s):

1. DC12V monitoring mode: The EUT powered by DC12V and keep monitoring continual.
2. PoE monitoring mode: The EUT powered by PoE and keep monitoring continual.



## 6.2.2 Test Setup and Procedure



1. The pre-test of the radiated emissions test was conducted in a semi-anechoic chamber and the final measurement was conducted in the open area test site.
2. Bilog antenna was used for the frequency range from 30MHz to 1GHz
3. The EUT was connected to the host PC which was connected to AC power source through a mains power outlet which was bonded to the ground reference plane; The mains cables shall drape to the ground reference plane. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT with located frequencies.
5. The actual frequencies of maximum emission were confirmed in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.

**6.2.3 Measurement Data**

An initial pre-scan was performed in the 3m chamber using the spectrum analyser in peak detection mode. The EUT was measured by Bilog antenna with 2 orthogonal polarities and frequencies of peak emissions from the EUT were detected within 20dB of the class B limit line. Final measurement was conducted in the open area test site with data as follows:

**Test results on DC12V monitoring mode:**

Frequency (MHz)	Antenna Polarization	Trans. (dB/m)	Receiver QP Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)
32.41	V	15.57	16.06	31.63	40.00	-8.37
32.52	H	15.58	2.72	18.30	40.00	-21.70
35.62	V	15.90	14.07	29.97	40.00	-10.03
60.49	H	12.55	11.19	23.74	40.00	-16.26
61.13	V	12.46	12.65	25.11	40.00	-14.89
109.41	V	9.59	10.84	20.43	43.50	-23.07
120.28	H	10.12	9.44	19.56	43.50	-23.94
134.09	V	12.16	8.37	20.53	43.50	-22.97
501.18	V	17.24	8.36	25.60	46.00	-20.40
504.71	H	17.33	9.32	26.65	46.00	-19.35
629.48	H	19.65	7.49	27.14	46.00	-18.86
925.76	H	22.99	10.71	33.70	46.00	-12.30
<b>Note:</b> 1) Transducer = Antenna Factor + Cable Loss. 2) Final Test Level = Receiver Reading + Transducer.						



Test results on PoE monitoring mode:

Frequency (MHz)	Antenna Polarization	Trans. (dB/m)	Receiver QP Reading (dBμV)	Emission Level (dBμV/m)	Limit (dBμV/m)	Over Limit (dB)
31.77	V	15.50	20.61	36.11	40.00	-3.89
33.33	H	15.67	16.46	32.13	40.00	-7.87
43.91	V	13.90	21.95	35.85	40.00	-4.15
43.97	H	13.90	17.55	31.45	40.00	-8.55
51.48	V	10.91	17.17	28.08	40.00	-11.92
210.05	H	9.86	11.56	21.42	43.50	-22.08
303.54	V	13.27	2.98	16.25	46.00	-29.75
312.18	H	13.45	10.87	24.32	46.00	-21.68
375.94	H	14.68	8.86	23.54	46.00	-22.46
501.18	V	17.24	12.82	30.06	46.00	-15.94
501.18	H	17.24	16.32	33.56	46.00	-12.44
958.79	V	23.36	10.50	33.86	46.00	-12.14
<b>Note:</b> 1) Transducer = Antenna Factor + Cable Loss. 2) Final Test Level = Receiver Reading + Transducer.						



### 6.3 Radiated Emissions, above 1GHz

Test Requirement: FCC Part15 B  
Test Method: ANSI C63.4:2014  
Test Voltage & frequency: 120V AC, 60Hz  
Test Date: 2017-07-05  
Frequency Range: 1GHz to 6GHz  
Measurement Distance: 3m  
Detector: Peak for pre-scan (1MHz resolution bandwidth)  
Peak and Average if maximised peak within 20dB of limit  
Class: Class B

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement Range (MHz)
Below 1.705	30
1.705 to 108	1000
108 to 500	2000
500 to 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower
Average limits dB(μV/m)	Peak limits dB(μV/m)
54	74

#### 6.3.1 EUT Operation

Operating Environment:

Temperature: 25°C

Humidity: 47%

Atmospheric Pressure: 1020mbar

EUT Operation:

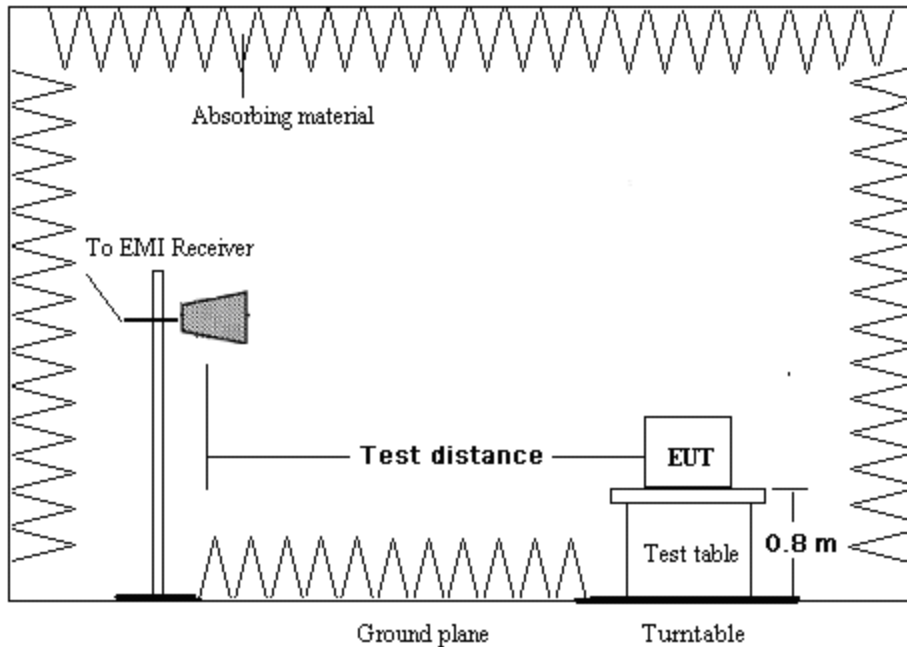
Pre-test with Peak detector with the following mode(s):

1. DC12V monitoring mode: The EUT powered by DC12V and keep monitoring continual.
2. PoE monitoring mode: The EUT powered by PoE and keep monitoring continual.

Final test with Quasi-Peak and Average detector with the following mode(s):

1. DC12V monitoring mode: The EUT powered by DC12V and keep monitoring continual.
2. PoE monitoring mode: The EUT powered by PoE and keep monitoring continual.

### 6.3.2 Test Setup and Procedure



1. The radiated emissions test was conducted in a fully-anechoic chamber.
2. Horn antenna was used for the frequency above 1GHz.
3. The EUT was connected to the host PC which was connected to AC power source through a mains power outlet which was bonded to the ground reference plane; The mains cables shall drape to the ground reference plane. The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane, but separated from metallic contact with the ground reference plane by 0.1m of insulation.
4. Before final measurements of radiated emissions, a pre-scan was performed in the spectrum mode with the peak detector to find out the maximum emissions spectrum plots of the EUT with located frequencies.
5. The actual frequencies of maximum emission were confirmed in the final radiated emissions measurement. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters, and keeping point the antenna in cones of radiation from EUT area both in azimuth and elevation in order to determine the maximum disturbance. Measurements were performed for both horizontal and vertical antenna polarization.

**6.3.3 Measurement Data**

An initial pre-scan was performed in the 3m chamber using the spectrum analyser in peak detection mode. The EUT was measured by Horn antenna with 2 orthogonal polarities and frequencies of peak emissions from the EUT were detected within 20dB of the class B limit line. Final measurement was conducted in the open area test site with data as follows:

**Test results on DC12V monitoring mode:**

Frequency (GHz)	Antenna Polarization	Trans. (dB/m)	Receiver Reading (dBμV)	Emission Level (dBμV/m)	Detector	Limit (dBμV/m)	Over Limit (dB)
4218.19	H	30.11	-5.62	24.49	Average	54	-29.51
4218.19	H	30.11	9.26	39.37	Peak	74	-34.63
5194.04	V	31.72	-4.23	27.49	Average	54	-26.51
5194.04	V	31.72	10.54	42.26	Peak	74	-31.74
7097	V	35.67	-4.86	30.81	Average	54	-23.19
7097	V	35.67	10.59	46.26	Peak	74	-27.74
8688.48	H	37	-3.97	33.03	Average	54	-20.97
8688.48	H	37	11.74	48.74	Peak	74	-25.26
9502.93	V	38.5	-6.91	31.59	Average	54	-22.41
9502.93	V	38.5	9	47.5	Peak	74	-26.5
12114.35	H	38.97	-3.69	35.28	Average	54	-18.72
12114.35	H	38.97	12.97	51.94	Peak	74	-22.06
14618.17	H	41.75	13.48	55.23	Average	74	-18.77
14618.17	H	41.75	1.02	42.77	Peak	54	-11.23
15046.85	V	41.11	1.48	42.59	Average	54	-11.41
15046.85	V	41.11	12.39	53.5	Peak	74	-20.5
15090.4	H	40.92	4.74	45.66	Average	54	-8.34
15090.4	H	40.92	15.21	56.13	Peak	74	-17.87
15532.94	V	39.07	14.18	53.25	Average	74	-20.75
15532.94	V	39.07	2.84	41.91	Peak	54	-12.09
17793.09	H	47.74	-0.78	46.96	Average	54	-7.04
17793.09	H	47.74	8.12	55.86	Peak	74	-18.14
17896.25	V	49.32	5.66	54.98	Average	74	-19.02
17896.25	V	49.32	-6.13	43.19	Peak	54	-10.81
<b>Note:</b> 1) Transducer = Antenna Factor + Cable Loss - Pre-amp. 2) Final Test Level = Receiver Reading + Transducer .							

**Test results on PoE monitoring mode:**

Frequency (GHz)	Antenna Polarization	Trans. (dB/m)	Receiver Reading (dBμV)	Emission Level (dBμV/m)	Detector	Limit (dBμV/m)	Over Limit (dB)
7943.84	H	37.15	-6.16	30.99	Average	54	-23.01
7943.84	H	37.15	9.39	46.54	Peak	74	-27.46
8814.96	V	37.12	-2.93	34.19	Average	54	-19.81
8814.96	V	37.12	12.23	49.35	Peak	74	-24.65
8866.06	H	37.17	-5.55	31.62	Average	54	-22.38
8866.06	H	37.17	10.93	48.1	Peak	74	-25.9
9502.93	V	38.5	-3.72	34.78	Average	54	-19.22
9502.93	V	38.5	12	50.5	Peak	74	-23.5
10636.85	H	39.92	9.02	48.94	Average	74	-25.06
10636.85	H	39.92	-7.19	32.73	Peak	54	-21.27
12114.35	V	38.97	-3.69	35.28	Average	54	-18.72
12114.35	V	38.97	13.61	52.58	Peak	74	-21.42
12114.35	H	38.97	-4.63	34.34	Average	54	-19.66
12114.35	H	38.97	11.97	50.94	Peak	74	-23.06
14119.83	V	41.3	-4.83	36.47	Average	54	-17.53
14119.83	V	41.3	13.65	54.95	Peak	74	-19.05
15090.4	H	40.92	-5.54	35.38	Average	54	-18.62
15090.4	H	40.92	12.21	53.13	Peak	74	-20.87
15804.66	V	38.31	0.56	38.87	Average	54	-15.13
15804.66	V	38.31	19.57	57.88	Peak	74	-16.12
16842.29	V	39.97	-2.55	37.42	Average	54	-16.58
16842.29	V	39.97	16.97	56.94	Peak	74	-17.06
17793.09	H	47.74	-10.78	36.96	Average	54	-17.04
17793.09	H	47.74	7.12	54.86	Peak	74	-19.14
<b>Note:</b> 1) Transducer = Antenna Factor + Cable Loss - Pre-amp. 2) Final Test Level = Receiver Reading + Transducer .							

## 7 Photographs

### 7.1 Conducted Emission Test Setup



### 7.2 Radiated Emission Test Setup





### 7.3 EUT Constructional Details





**--End of the Report--**