

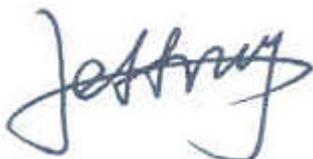
FCC Test Report (DoC)

Application No.: HKEM1704000377IT
Applicant: Zhejiang Dahua Vision Technology Co., Ltd.
Manufacturer: Zhejiang Dahua Vision Technology Co., Ltd.
Factory: Zhejiang Dahua Vision Technology Co., Ltd.
Product Information:
Product Name: IP CAMERA
Model: DH-IPC-HDB4431GP-AS, DH-IPC-HDB4231GN-AS, DH-IPC-HDB4231GP-AS, IPC-HDB4231GP-AS, IPC-HDB4231GN-AS, DH-IPC-HDP4231GN-AS, DH-IPC-HDP4231GP-AS, IPC-HDP4231GP-AS, IPC-HDP4231GN-AS, DH-IPC-HDB4431GN-AS, IPC-HDB4431GP-AS, IPC-HDB4431GN-AS, DH-IPC-HDP4431GP-AS, DH-IPC-HDP4431GN-AS, IPC-HDP4431GP-AS, IPC-HDP4431GN-AS
Serial No.: --
Requirement: 47 CFR PART 15,SUBPART B:2016
Date of Receipt: 2017-03-30
Date of Test: 2017-04-01 to 2017-04-10
Date of Issue: 2017-04-17

Test Result :	PASS*
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* In the configuration tested, the EUT complied with the standards specified above

Authorized Signature:



CHEN Jian-feng, Jeffrey



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 IECC Ltd. or testing done by SGS IECC Ltd. in connection with, distribution or use of the product described in this report must be approved by SGS IECC Ltd. in writing.

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2 Test Summary

Test	Test Requirement	Test Method	Class / Severity	Result
Conducted Emission (150kHz to 30MHz)	FCC PART 15, SUBPART B: 2016	ANSI C63.4:2014	Class B	PASS
Radiated Emission (30MHz to 1GHz)	FCC PART 15, SUBPART B: 2016	ANSI C63.4:2014	Class B	PASS
Radiated Emission above 1 GHz	FCC PART 15, SUBPART B: 2016	ANSI C63.4:2014	Class B	N/A ¹⁾
Remark : 1) Please refer to section 6.3 of this report for explanation				

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4 General Information

4.1 Client Information

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
 Factory: Zhejiang Dahua Vision Technology Co., Ltd.
 Address of Factory: No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China

4.2 General Description of EUT

EUT Name: IP CAMERA
 Model: DH-IPC-HDB4431GP-AS, DH-IPC-HDB4231GN-AS, DH-IPC-HDB4231GP-AS, IPC-HDB4231GP-AS, IPC-HDB4231GN-AS, DH-IPC-HDP4231GN-AS, DH-IPC-HDP4231GP-AS, IPC-HDP4231GP-AS, IPC-HDP4231GN-AS, DH-IPC-HDB4431GN-AS, IPC-HDB4431GP-AS, IPC-HDB4431GN-AS, DH-IPC-HDP4431GP-AS, DH-IPC-HDP4431GN-AS, IPC-HDP4431GP-AS, IPC-HDP4431GN-AS
 Serial No.: --
 EUT Description: IP camera with LAN port which can be connect with PC to monitor video.

4.3 Details of EUT

Power Supply: DC12V,0.5A / POE:48V 150mA
 Power Cord: --

4.4 Description of Support Units

Supporting equipment :

Description	Manufacturer	Model No.
Laptop 1	LENOVO	R400
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 ¹⁾	1.5	Yes	No	No
5	USB ²⁾	1.8	Yes	No	No
6	USB ³⁾	1.8	Yes	No	No

Software:

Description	Manufacturer	Software name	Version no.
EMC test software	Microsoft	Internet Explorer	11.0.9600.18204
EMC test software	Microsoft	command prompt	6.1.7601

4.5 Standards Applicable for Testing

CFR 47, FCC Part 15, 2016
ANSI C63.4:2014

4.6 Test Location

All tests were performed at: -

SGS IECC Limited (Member of the SGS Group (SGS SA))

Units 303-305, 3/F., 31 Lok Yip Road, On Lok Tsuen, Fanling, N.T., Hong Kong

Tel: +852 2305 2570 Fax: +852 2756 4480.

No tests were sub-contracted.

4.7 Test Facility

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

- **FCC – CAB Registration No.: 446297**

Measurement facility located at Fanling (Hong Kong), accredited as a Conformity Assessment Body (CAB) and was designated by FCC to perform compliance testing on equipment subject to Declaration Of Conformity (DOC) and Certification under Part 15 and 18 of the Commission's Rules.

4.8 Deviation from Standards

None.

4.9 Abnormalities from Standard Conditions

None.

4.10 Declaration of Family Grouping

Model No.: DH-IPC-HDB4431GP-AS, DH-IPC-HDB4231GN-AS, DH-IPC-HDB4231GP-AS, IPC-HDB4231GP-AS, IPC-HDB4231GN-AS, DH-IPC-HDP4231GN-AS, DH-IPC-HDP4231GP-AS, IPC-HDP4231GP-AS, IPC-HDP4231GN-AS, DH-IPC-HDB4431GN-AS, IPC-HDB4431GP-AS, IPC-HDB4431GN-AS, DH-IPC-HDP4431GP-AS, DH-IPC-HDP4431GN-AS, IPC-HDP4431GP-AS, IPC-HDP4431GN-AS

Only the model DH-IPC-HDB4431GP-AS was tested, since the electrical circuit design, PCB layout, components used and internal wiring were identical for the above models, with only difference being pixels and sales area.

4.11 Abbreviations

N/A: Not Applicable

EUT: Equipment Under Test

4.12 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	2016/04/20	2017/04/19

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	2016/05/31	2017/05/30
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 / -	--	--

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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:	2017-04-01
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

Note:

- 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.

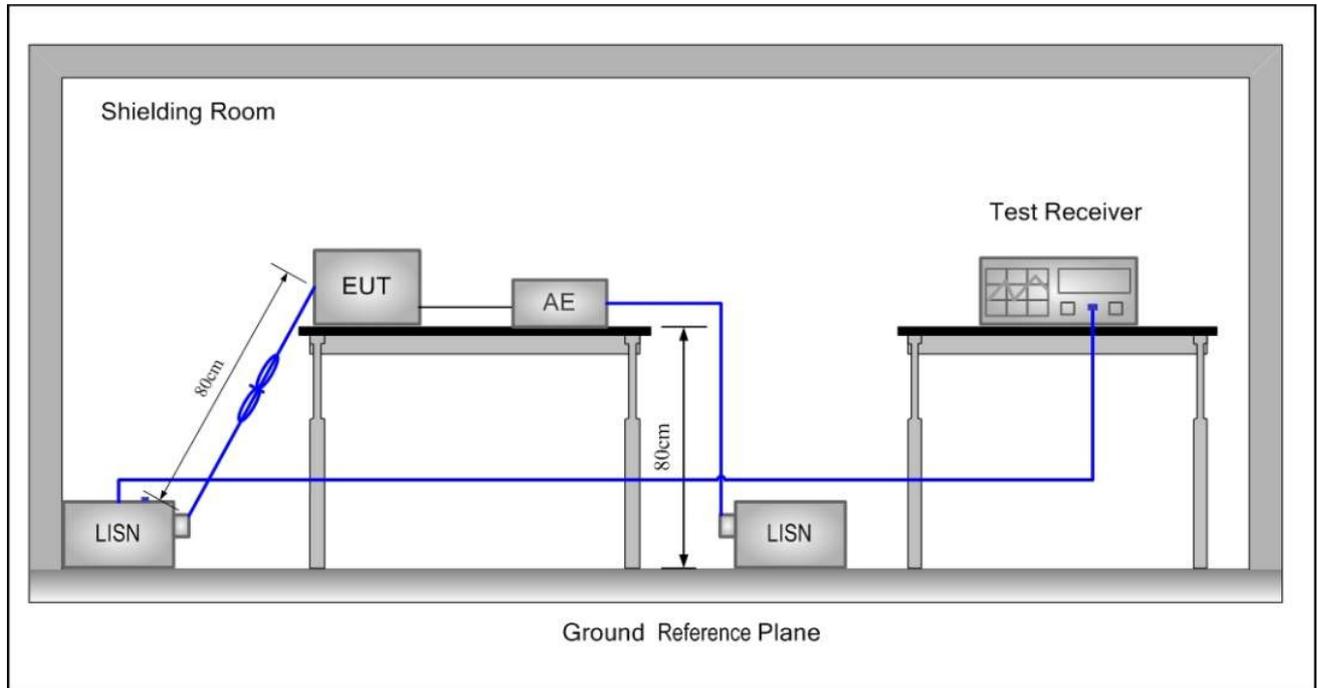
6.1.1 EUT Operation

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: (Powered by DC12V, keep EUT monitoring continual)
	2: PoE monitoring mode:(Powered by Poe adapter , keep EUT monitoring continual.)
	Final test with Quasi-Peak and Avearge detector with the following mode(s):
	1: DC12V Monitoring mode: (Powered by DC12V, keep EUT monitoring continual)
	2: PoE monitoring mode:(Powered by Poe adapter, keep EUT 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.

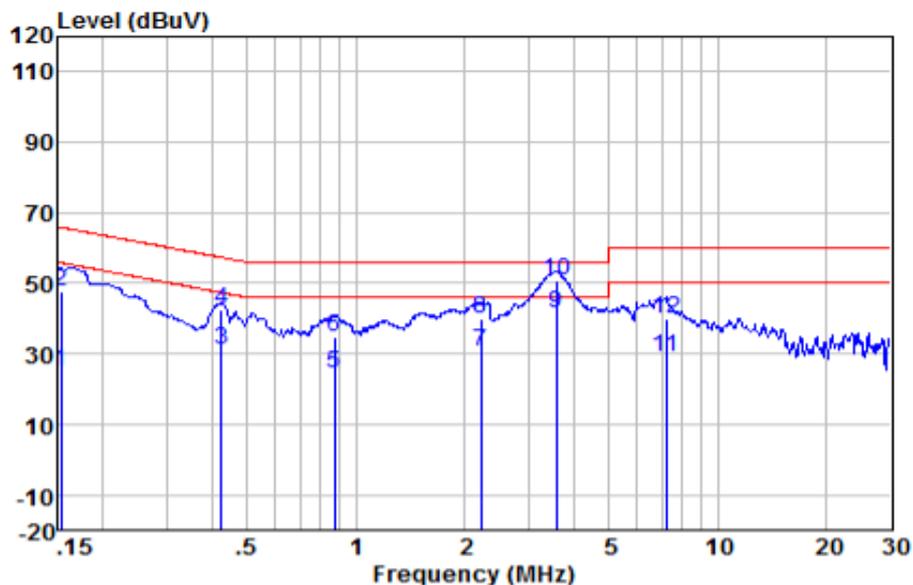
Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

The following Quasi-Peak and Average measurements were performed on

DC 12V Monitoring MODE :

Live line:

Peak Scan:



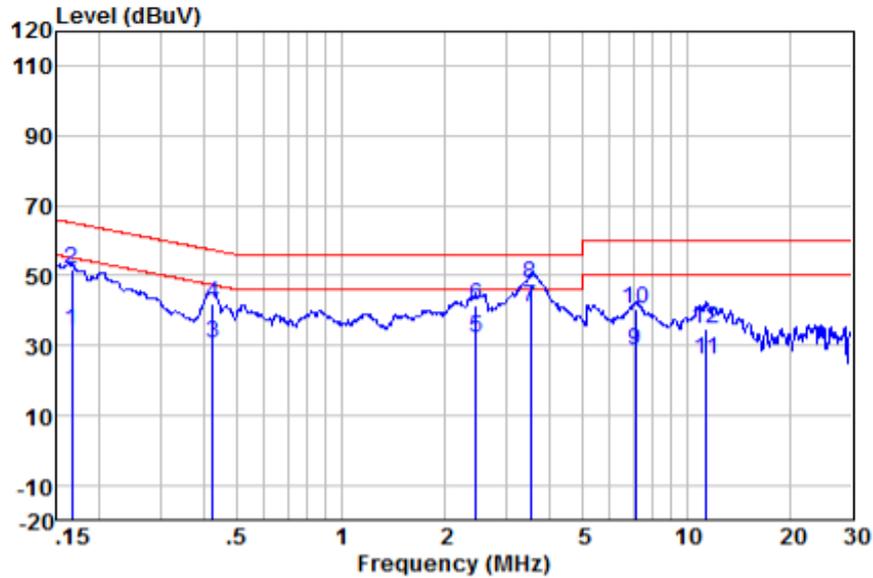
Quasi-peak and Average measurement:

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.152	24.63	0.14	0.10	24.87	55.87	-31.00	Average
2	0.152	47.51	0.14	0.10	47.75	65.87	-18.12	QP
3	0.424	31.12	0.05	0.10	31.27	47.37	-16.10	Average
4	0.424	42.23	0.05	0.10	42.38	57.37	-14.99	QP
5	0.876	24.38	0.16	0.10	24.64	46.00	-21.36	Average
6	0.876	34.45	0.16	0.10	34.71	56.00	-21.29	QP
7	2.213	30.25	0.20	0.10	30.55	46.00	-15.45	Average
8	2.213	39.69	0.20	0.10	39.99	56.00	-16.01	QP
9	3.584	41.31	0.26	0.10	41.67	46.00	-4.33	Average
10	3.584	50.35	0.26	0.10	50.71	56.00	-5.29	QP
11	7.213	28.73	0.28	0.10	29.11	50.00	-20.89	Average
12	7.213	39.70	0.28	0.10	40.08	60.00	-19.92	QP

Level = Read Level + LISN Factor + Cable Loss.

Neutral line:

Peak Scan:



Quasi-peak and Average measurement:

	Read	LISN	Cable	Limit	Over		
Freq	Level	Factor	Loss	Line	Limit	Remark	
MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.166	34.05	0.12	0.10	34.27	55.16	-20.89 Average
2	0.166	51.72	0.12	0.10	51.94	65.16	-13.22 QP
3	0.426	30.51	0.02	0.10	30.63	47.33	-16.70 Average
4	0.426	41.90	0.02	0.10	42.02	57.33	-15.31 QP
5	2.461	31.79	0.20	0.10	32.09	46.00	-13.91 Average
6	2.461	41.40	0.20	0.10	41.70	56.00	-14.30 QP
7	3.547	40.66	0.19	0.10	40.95	46.00	-5.05 Average
8	3.547	47.58	0.19	0.10	47.87	56.00	-8.13 QP
9	7.100	28.42	0.28	0.10	28.80	50.00	-21.20 Average
10	7.100	39.99	0.28	0.10	40.37	60.00	-19.63 QP
11	11.438	25.50	0.29	0.13	25.92	50.00	-24.08 Average
12	11.438	34.59	0.29	0.13	35.01	60.00	-24.99 QP

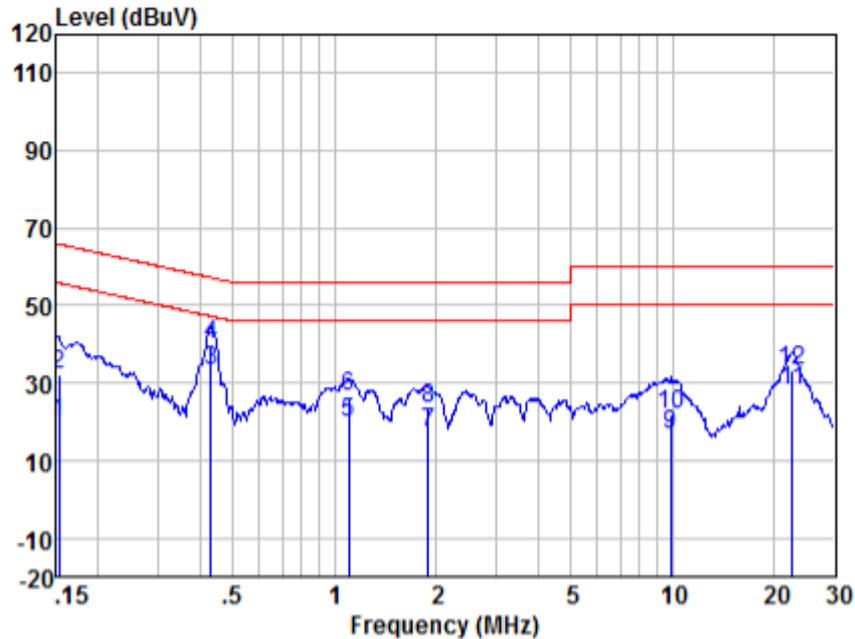
Level = Read Level + LISN Factor + Cable Loss.

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PoE monitoring mode:

Live line:

Peak Scan:



Quasi-peak and Average measurement:

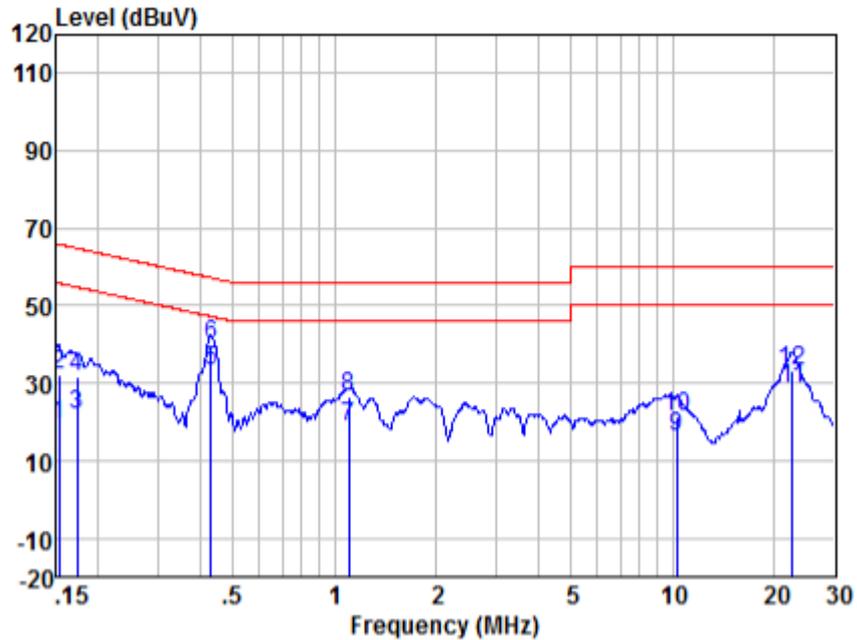
	Read Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.152	19.66	0.14	0.10	19.90	55.87	-35.97	Average
2	0.152	31.81	0.14	0.10	32.05	65.87	-33.82	QP
3	0.431	33.21	0.05	0.10	33.36	47.24	-13.88	Average
4	0.431	39.86	0.05	0.10	40.01	57.24	-17.23	QP
5	1.100	19.42	0.16	0.10	19.68	46.00	-26.32	Average
6	1.100	26.11	0.16	0.10	26.37	56.00	-29.63	QP
7	1.888	16.71	0.20	0.10	17.01	46.00	-28.99	Average
8	1.888	22.92	0.20	0.10	23.22	56.00	-32.78	QP
9	9.861	16.45	0.31	0.10	16.86	50.00	-33.14	Average
10	9.861	21.58	0.31	0.10	21.99	60.00	-38.01	QP
11	22.655	27.44	0.62	0.20	28.26	50.00	-21.74	Average
12	22.655	32.56	0.62	0.20	33.38	60.00	-26.62	QP

Level = Read Level + LISN Factor + Cable Loss.

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Neutral line:

Peak Scan:



Quasi-peak and Average measurement:

	Freq	Read Level	LISN Factor	Cable Loss	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dBuV	dBuV	dB	
1	0.152	18.98	0.14	0.10	19.22	55.87	-36.65	Average
2	0.152	31.75	0.14	0.10	31.99	65.87	-33.88	QP
3	0.173	21.73	0.12	0.10	21.95	54.81	-32.86	Average
4	0.173	31.63	0.12	0.10	31.85	64.81	-32.96	QP
5	0.431	32.94	0.02	0.10	33.06	47.24	-14.18	Average
6	0.431	39.85	0.02	0.10	39.97	57.24	-17.27	QP
7	1.100	18.64	0.16	0.10	18.90	46.00	-27.10	Average
8	1.100	26.03	0.16	0.10	26.29	56.00	-29.71	QP
9	10.288	15.81	0.31	0.11	16.23	50.00	-33.77	Average
10	10.288	21.13	0.31	0.11	21.55	60.00	-38.45	QP
11	22.655	27.77	0.56	0.20	28.53	50.00	-21.47	Average
12	22.655	32.65	0.56	0.20	33.41	60.00	-26.59	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: 2017-04-01
 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

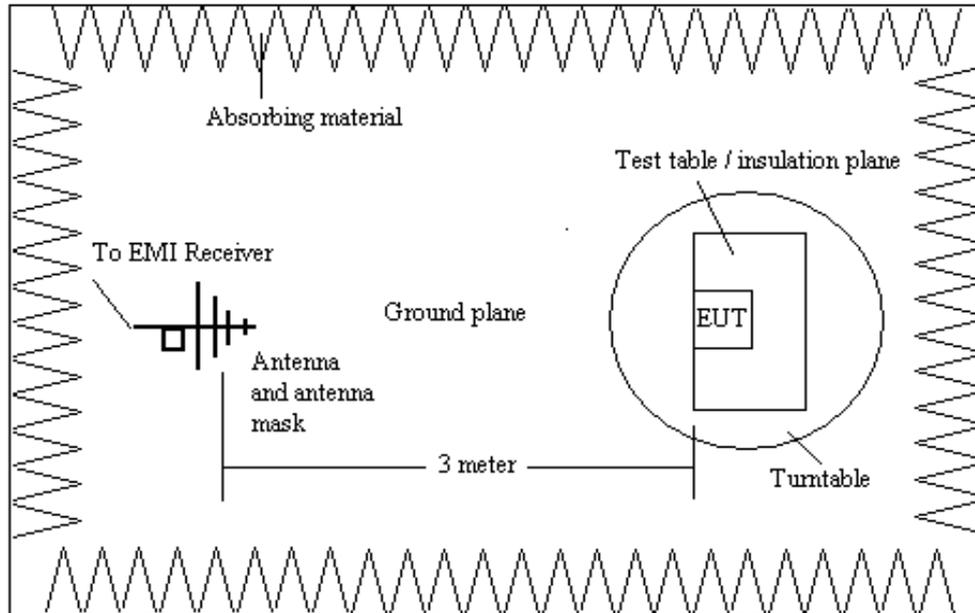
EUT Operation: Pre-test with Peak detector with the following mode(s):

- 1: DC12V Monitoring mode: (Powered by DC12V, keep EUT monitoring continual)
- 2: PoE monitoring mode:(Powered by Poe adapter , keep EUT monitoring continual.)

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

- 1: DC12V Monitoring mode: (Powered by DC12V, keep EUT monitoring continual)
- 2: PoE monitoring mode:(Powered by Poe adapter, keep EUT 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 DC 12V Monitoring mode:

Frequency (MHz)	Antenna Polarization	Trans. (dB/m)	Receiver QP Reading (dB μ V)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Over Limit (dB)
150.01	H	12.80	16.96	29.76	43.50	-13.74
216.02	V	10.14	18.54	28.68	46.00	-17.32
216.02	H	10.14	20.49	30.63	46.00	-15.37
263.82	V	12.24	23.20	35.44	46.00	-10.56
263.82	H	12.24	23.46	35.70	46.00	-10.30
312.18	V	13.38	17.62	31.00	46.00	-15.00
408.95	V	15.35	20.76	36.11	46.00	-9.89
408.95	H	15.35	19.60	34.95	46.00	-11.05
504.71	V	17.32	25.13	42.45	46.00	-3.55
504.71	H	17.32	26.94	44.26	46.00	-1.74
550.95	H	19.20	15.54	34.74	46.00	-11.26
842.13	V	23.64	10.01	33.65	46.00	-12.35

Note:

- 1) All readings are Quasi-Peak values.
- 2) Transducer = Antenna Factor + Cable Loss.

Test results on PoE Monitoring mode:

Frequency (MHz)	Antenna Polarization	Trans. (dB/m)	Receiver QP Reading (dB μ V)	Emission Level (dB μ V/m)	Limit (dB μ V/m)	Over Limit (dB)
42.60	V	13.72	6.95	20.67	40.00	-19.33
49.88	V	13.81	11.46	25.27	40.00	-14.73
98.49	V	9.15	13.04	22.19	43.50	-21.31
102.72	H	9.69	8.37	18.06	43.50	-25.44
150.01	V	12.80	16.51	29.31	43.50	-14.19
150.01	H	12.80	10.78	23.58	43.50	-19.92
216.02	H	10.14	20.36	30.50	46.00	-15.50
263.82	V	12.24	20.00	32.24	46.00	-13.76
263.82	H	12.24	20.95	33.19	46.00	-12.81
455.91	H	16.58	18.98	35.56	46.00	-10.44
504.71	V	17.32	22.48	39.80	46.00	-6.20
504.71	H	17.32	22.37	39.69	46.00	-6.31

Note:

- 1) All readings are Quasi-Peak values.
- 2) Transducer = Antenna Factor + Cable Loss.

6.3 Radiated Emissions above 1 GHz

Test Requirement: FCC Part15 B
Test Method: ANSI C63.4:2014
Test Date: Not Applicable

Remark:

There is no need for Radiated Emissions (above 1G) test to be performed on this product in accordance with FCC Part 15 because the highest internal source is less than 108 MHz.

For further details, please refer to Subject B section 15.33 (b) (1)of FCC Part 15 which states:

The spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

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

7 Photographs

7.1 Conducted Emission Test Setup



7.2 Radiated Emission Test Setup



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7.3 EUT Constructional Details



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