



EN 55032  
EN 55024  
EN 50130-4  
EN 61000-3-2  
EN 61000-3-3

## EMC TEST REPORT

*For*

**IP CAMERA**

**MODEL NUMBER: DH-IPC-HFW4431SP, DH-IPC-HFW4431SN, IPC-HFW4431SP, IPC-HFW4431SN, DH-IPC-HFW44B1SN, DH-IPC-HFW4231SP, DH-IPC-HFW4231SN, IPC-HFW4231SP, IPC-HFW4231SN, DH-IPC-HFW42B1SN, IPC-HFW1230SN, IPC-HFW1230SP, DH-IPC-HFW1230SN, DH-IPC-HFW1230SP, DH-IPC-HFW12B0SN, IPC-HFW1431SN, IPC-HFW1431SP, DH-IPC-HFW1431SN, DH-IPC-HFW1431SP, DH-IPC-HFW14B0SN, DH-IPC-HFW1531SP, DH-IPC-HFW1531SN, DH-IPC-HFW1531SP, DH-IPC-HFW1531SN, IPC-HFW1531SP, IPC-HFW1531SN, IPC-HFW1531SN, IPC-HFW1531SP, IPC-HFW1531SN, DH-IPC-HFW1231SP, DH-IPC-HFW1231SN, IPC-HFW1231SP, IPC-HFW1231SN, DH-IPC-HFW1231S, IPC-HFW1231S, IPC-HFW1430SP, IPC-HFW1430SN, IPC-HFW1230SP-L, IPC-HFW1230SN-L, DH-IPC-HFW1231SP-B, DH-IPC-HFW1430SP, DH-IPC-HFW1430SN, DH-IPC-HFW1230SP-L, DH-IPC-HFW1230SN-L, N51BD22, N51BD23, DH-IPC-HFW1225SP, DH-IPC-HFW1425SP, DH-IPC-HFW1225SP-L, DH-IPC-HFW1226SP-0360B, DH-IPC-HFW1226SP-0280B**

**And**

**DH-IPC-HFW14B0SP, DH-IPC-HFW14B0SN, DH-IPC-HFW12B0SP, DH-IPC-HFW12B0SN**

**REPORT NUMBER: 4788906073-1**

**ISSUE DATE: March 1, 2019**

*Prepared for*

**Zhejiang Dahua Vision Technology Co., Ltd.  
No.1199, Bin'an road, Binjiang District, Hangzhou, P.R.China.**

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Revision History

Rev.	Issue Date	Revisions	Revised By
--	03/01/2018	Initial Issue	



## Test Summary

**Electromagnetic Interference (EMI)**

EN 55032: 2015

EN 61000-3-2:2014

EN 61000-3-3:2013

Test Items	Test Method	Reference Clause	Result
Radiated Emission	EN 55032: 2015	CISPR 16-2-1:2014	PASS
Conducted Emission	EN 55032: 2015	CISPR 16-2-3: 2010+A1:2010+A2:2 014	PASS
Harmonic Emission on AC	EN 61000-3-2:2014	EN 61000-3-2:2014	PASS
Flicker Emission on AC	EN 61000-3-3:2013	EN 61000-3-3:2013	PASS

**Electromagnetic Susceptibility (EMS)**

EN 50130-4:2011/A1:2014

EN 55024: 2010/A1:2015

ESD	EN 50130-4:2011/A1:2014 EN 55024: 2010/A1:2015	EN 61000-4-2:2009	PASS
Radiated Immunity	EN 50130-4:2011/A1:2014 EN 55024: 2010/A1:2015	EN 61000-4-3:2006 +A1:2008+A2:2010	PASS
Electrical Fast Transients (EFT) on AC	EN 50130-4:2011/A1:2014 EN 55024: 2010/A1:2015	EN 61000-4-4:2012	PASS
Surge Immunity on AC	EN 50130-4:2011/A1:2014 EN 55024: 2010/A1:2015	EN 61000-4-5:2014	PASS
Conducted Immunity on AC	EN 50130-4:2011/A1:2014 EN 55024: 2010/A1:2015	EN 61000-4-6:2014	PASS
Power Frequency Magnetic Field	EN 55024: 2010/A1:2015	EN 61000-4-8:2010	N/A
Voltage Dips and Interruptions on AC	EN 50130-4:2011/A1:2014 EN 55024: 2010/A1:2015	EN 61000-4-11:2004	PASS

Note 1, N/A is an abbreviation for Not Applicable.

Note 2,

The model, DH-IPC-HFW14B0SP, DH-IPC-HFW14B0SN, according to the confirmation from the applicant, since the electrical circuit design, layout, components used and internal wiring were identical for the model IPC-HFW1430SN, only difference being the item numbers.

The model, DH-IPC-HFW12B0SP, DH-IPC-HFW12B0SN, according to the confirmation from the applicant, since the electrical circuit design, layout, components used and internal wiring were identical for the model IPC-HFW1230SN, only difference being the item numbers.

The detail test status, please refer the test report (report no.: 4788771244-1 ) on December 17, 2018.

Therefore, only four items DH-IPC-HFW14B0SP, DH-IPC-HFW14B0SN, DH-IPC-HFW12B0SP, DH-IPC-HFW12B0SN, were as additional new increased models in this report.



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# 1 ATTESTATION OF TEST RESULTS

## Applicant Information

Company Name: Zhejiang Dahua Vision Technology Co., Ltd.  
Address: No.1199, Bin'an road, Binjiang District, Hangzhou, P.R.China.

## Manufacturer Information

Company Name: Zhejiang Dahua Vision Technology Co., Ltd.  
Address: No.1199, Bin'an road, Binjiang District, Hangzhou, P.R.China.

## EUT Information

EUT Name: IP CAMERA  
Model: DH-IPC-HFW4431SP, DH-IPC-HFW4431SN, IPC-HFW4431SP, IPC-HFW4431SN, DH-IPC-HFW44B1SN, DH-IPC-HFW4231SP, DH-IPC-HFW4231SN, IPC-HFW4231SP, IPC-HFW4231SN, DH-IPC-HFW42B1SN, IPC-HFW1230SN, IPC-HFW1230SP, DH-IPC-HFW1230SN, DH-IPC-HFW1230SP, DH-IPC-HFW12B0SN, IPC-HFW1431SN, IPC-HFW1431SP, DH-IPC-HFW1431SN, DH-IPC-HFW1431SP, DH-IPC-HFW14B0SN, DH-IPC-HFW1531SP, DH-IPC-HFW1531SN, DH-IPC-HFW1531SP, DH-IPC-HFW1531SN, IPC-HFW1531SP, IPC-HFW1531SN, IPC-HFW1531SN, DH-IPC-HFW1231SP, DH-IPC-HFW1231SN, IPC-HFW1231SP, IPC-HFW1231SN, DH-IPC-HFW1231S, IPC-HFW1231S, IPC-HFW1430SP, IPC-HFW1430SN, IPC-HFW1230SP-L, IPC-HFW1230SN-L, DH-IPC-HFW1231SP-B, DH-IPC-HFW1430SP, DH-IPC-HFW1430SN, DH-IPC-HFW1230SP-L, DH-IPC-HFW1230SN-L, N51BD22, N51BD23, DH-IPC-HFW1225SP, DH-IPC-HFW1425SP, DH-IPC-HFW1225SP-L, DH-IPC-HFW1226SP-0360B, DH-IPC-HFW1226SP-0280B, DH-IPC-HFW14B0SP, DH-IPC-HFW14B0SN, DH-IPC-HFW12B0SP, DH-IPC-HFW12B0SN,

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
EN 55032:2015 EN 61000-3-2:2014 EN 61000-3-3:2013 EN 50130-4:2011+A1:2014 EN 55024:2010+A1:2015	PASS



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Checked By:

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Approved By:

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Stephen Guo  
Laboratory Manager

## 2 TEST METHODOLOGY

All tests were performed in accordance with the standard EN 55032, EN 55024, EN 61000-3-2, EN 61000-3-3 and EN 50130-4.

## 3 ACCREDITATION

Accreditation Certificate	<p><b>A2LA (Certificate No.: 4102.01)</b> UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA.</p> <p><b>FCC (FCC Recognized No.: CN1187)</b> UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules</p> <p><b>IC(Company No.: 21320)</b> UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with Industry Canada. The Company Number is 21320.</p>
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## 4 MEASURING EQUIPMENT AND SOFTWARE USED

All measuring equipment and software used are referred to the original report (report no.: 4788771244-1 ).



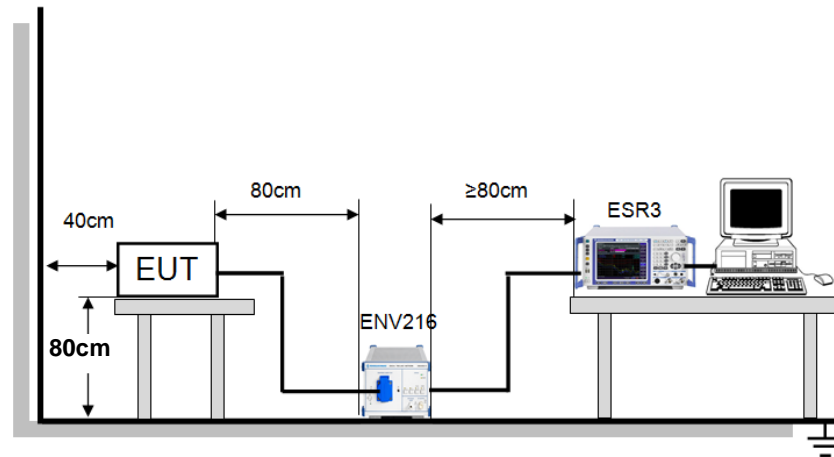
## 5 ELECTROMAGNETIC COMPATIBILITY (EMC)

### 5.1 ELECTROMAGNETIC INTERFERENCE (EMI)

#### 5.1.1 CONDUCTED EMISSION

<b>Test Method:</b>	EN 55032																										
<b>Detector:</b>	Peak for pre-scan (9kHz Resolution Bandwidth)																										
	Quasi-Peak if maximized peak within 6dB of Quasi-Peak limit																										
<b>Limit:</b>	<p>Limits for conducted disturbance at the mains ports of class B</p> <table><tr><th rowspan="2">Frequency Range (MHz)</th><th colspan="2">Class B Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15 to 0.50</td><td>66 to 56</td><td>56 to 46</td></tr><tr><td>0.50 to 5</td><td>56</td><td>46</td></tr><tr><td>5 to 30</td><td>60</td><td>50</td></tr></table> <p>NOTE 1: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.</p> <p>NOTE 2: The lower limit is applicable at the transition frequency.</p> <p>Limits for conducted disturbance at the wired network ports of class B</p> <table><tr><th rowspan="2">Frequency Range (MHz)</th><th colspan="2">Class B Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15 to 0.50</td><td>84 to 74</td><td>74 to 64</td></tr><tr><td>0.50 to 30</td><td>74</td><td>64</td></tr></table>		Frequency Range (MHz)	Class B Limit (dBuV)		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	Frequency Range (MHz)	Class B Limit (dBuV)		Quasi-peak	Average	0.15 to 0.50	84 to 74	74 to 64	0.50 to 30	74	64
Frequency Range (MHz)	Class B Limit (dBuV)																										
	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																									
Frequency Range (MHz)	Class B Limit (dBuV)																										
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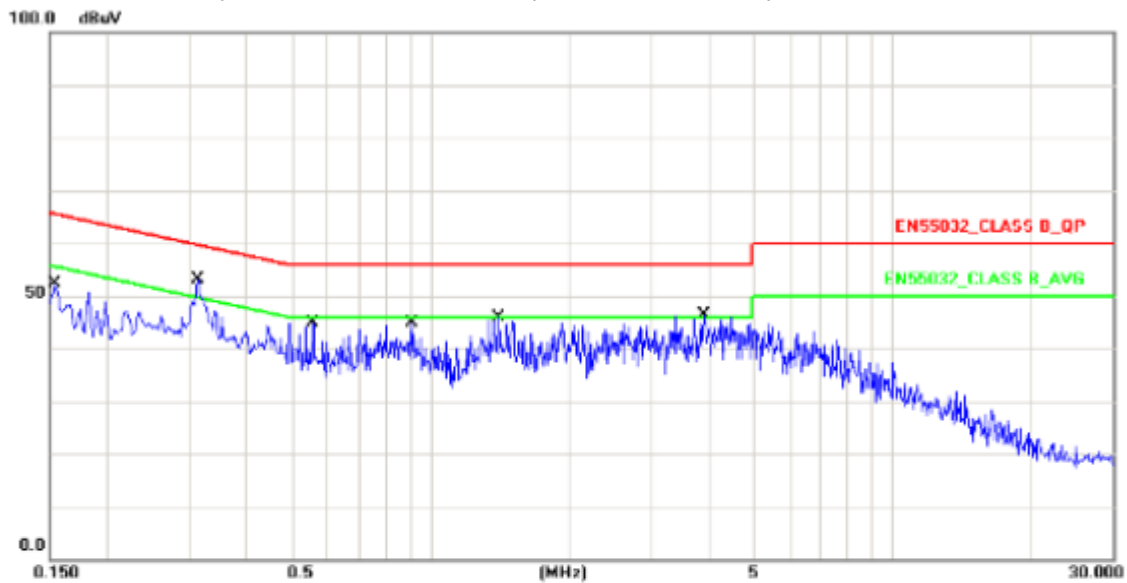
**Test Setup:**

**Test Procedure:**

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a  $50\Omega/50\mu\text{H} + 5\Omega$  linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 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.
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.

### Measurement Data

#### Conducted Emission for Power Port Test Data

Test Mode :	Mode 1: Full system for DH-IPC-HFW4431SP with Adapter + POE		
AC Power :	AC 110V/60Hz	Phase :	LINE
Equipment :	IP CAMERA	Model No :	DH-IPC-HFW4431SP
Temperature :	25°C	Humidity :	50%
Pressure(mbar) :	1002	Date :	2016/07/12

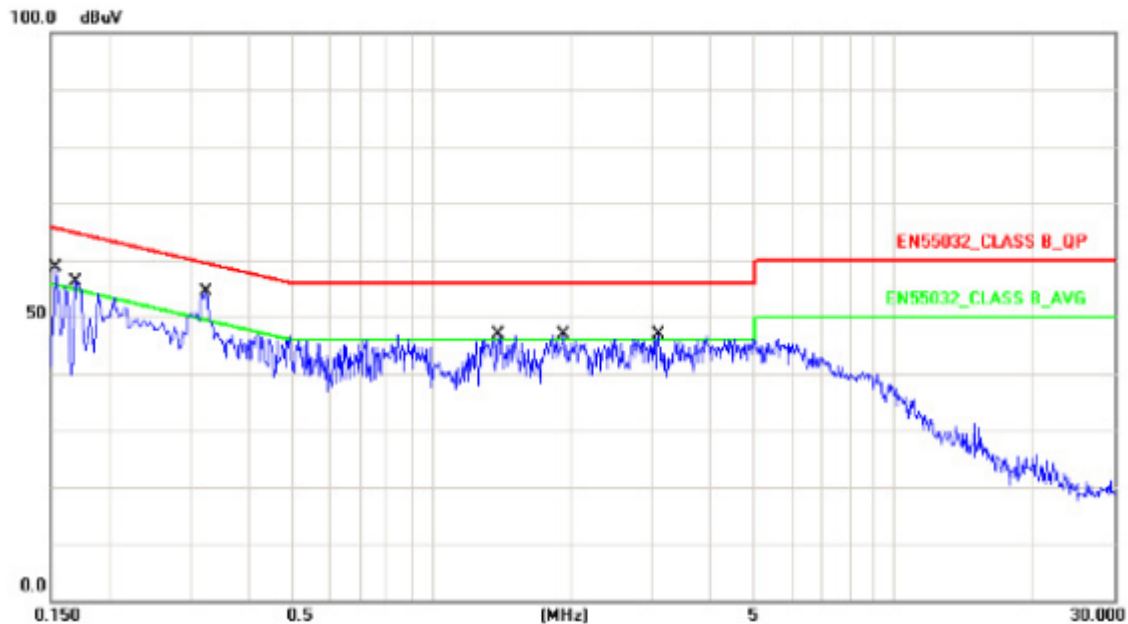


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1539	10.20	37.48	47.68	65.78	-18.10	QP
2	0.1539	10.20	7.99	18.19	55.78	-37.59	AVG
3	0.3140	10.24	35.17	45.41	59.86	-14.45	QP
4	0.3140	10.24	12.76	23.00	49.86	-26.86	AVG
5	0.5580	10.26	23.87	34.13	56.00	-21.87	QP
6	0.5580	10.26	3.77	14.03	46.00	-31.97	AVG
7	0.9140	10.31	23.87	34.18	56.00	-21.82	QP
8	0.9140	10.31	3.94	14.25	46.00	-31.75	AVG
9	1.4060	10.43	25.06	35.49	56.00	-20.51	QP
10	1.4060	10.43	4.13	14.56	46.00	-31.44	AVG
11	3.9100	10.53	22.55	33.08	56.00	-22.92	QP
12	3.9100	10.53	2.71	13.24	46.00	-32.76	AVG

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 1: Full system for DH-IPC-HFW4431SP with Adapter + POE		
AC Power :	AC 110V/60Hz	Phase :	NEUTRAL
Equipment :	IP CAMERA	Model No :	DH-IPC-HFW4431SP
Temperature :	25°C	Humidity :	50%
Pressure(mbar) :	1002	Date :	2016/07/12

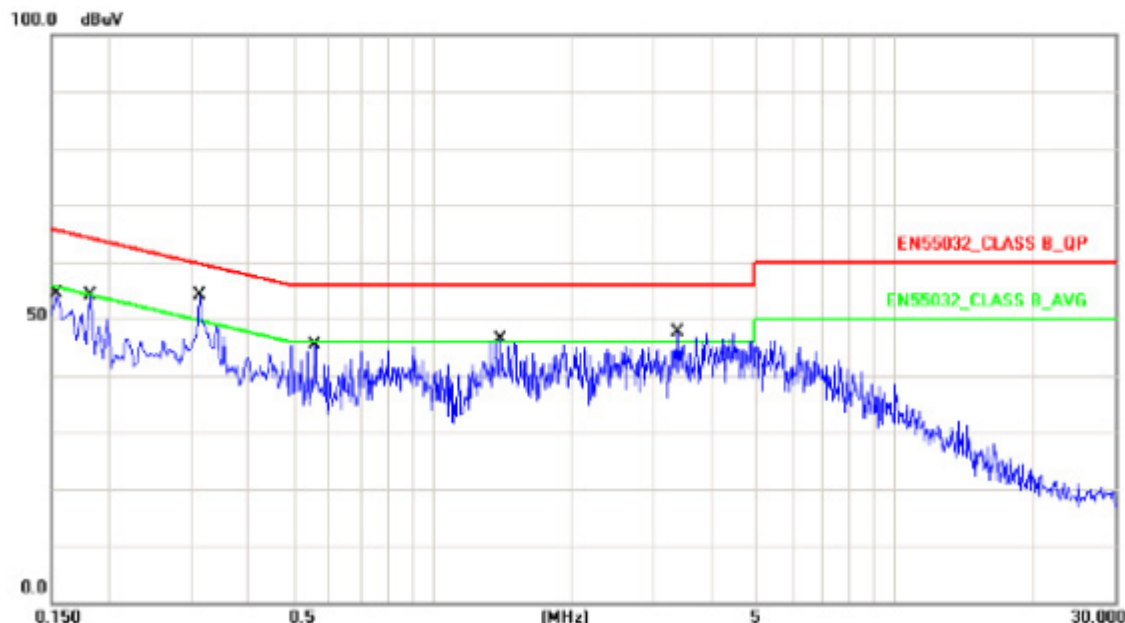


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1532	10.20	25.05	35.25	65.82	-30.57	QP
2	0.1532	10.20	4.82	15.02	55.82	-40.80	AVG
3	0.1694	10.20	22.94	33.14	64.98	-31.84	QP
4	0.1694	10.20	4.07	14.27	54.98	-40.71	AVG
5	0.3251	10.24	39.01	49.25	59.57	-10.32	QP
6	0.3251	10.24	16.81	27.05	49.57	-22.52	AVG
7	1.3884	10.42	29.74	40.16	56.00	-15.84	QP
8	1.3884	10.42	7.59	18.01	46.00	-27.99	AVG
9	1.9283	10.48	28.92	39.40	56.00	-16.60	QP
10	1.9283	10.48	6.51	16.99	46.00	-29.01	AVG
11	3.0901	10.51	26.39	36.90	56.00	-19.10	QP
12	3.0901	10.51	3.93	14.44	46.00	-31.56	AVG

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 2: Full system for DH-IPC-HFW4431SP with Adapter + POE		
AC Power :	AC 230V/50Hz	Phase :	LINE
Equipment :	IP CAMERA	Model No :	DH-IPC-HFW4431SP
Temperature :	25°C	Humidity :	50%
Pressure(mbar) :	1002	Date :	2016/07/12

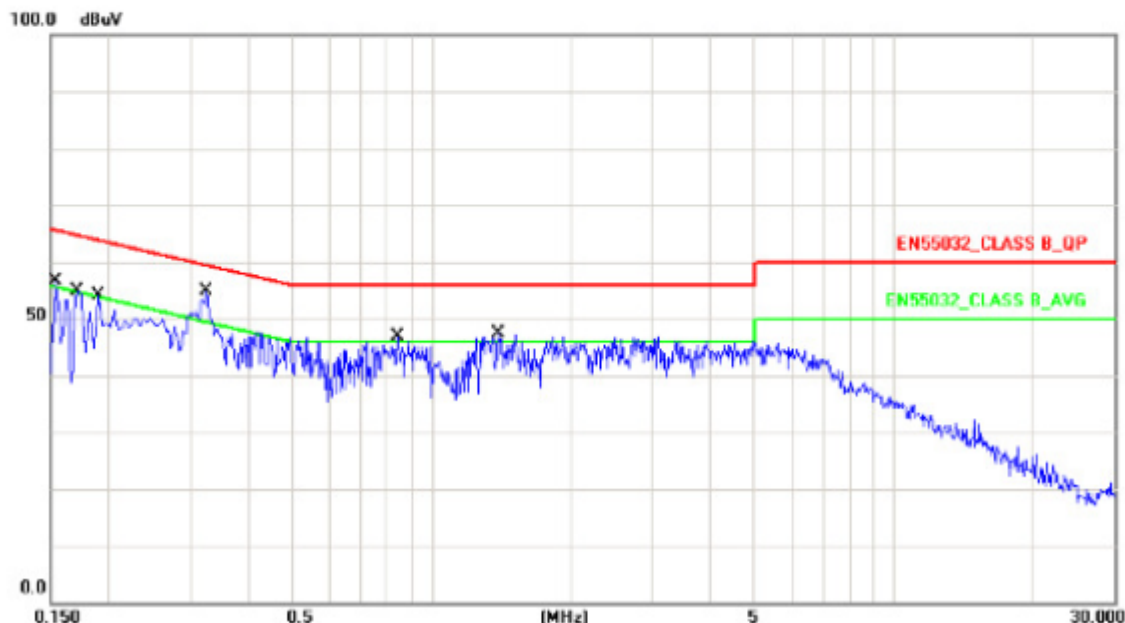


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1539	10.20	37.73	47.93	65.78	-17.85	QP
2	0.1539	10.20	8.32	18.52	55.78	-37.26	AVG
3	0.1819	10.20	32.07	42.27	64.39	-22.12	QP
4	0.1819	10.20	6.33	16.53	54.39	-37.86	AVG
5	0.3140	10.24	35.08	45.32	59.86	-14.54	QP
6	0.3140	10.24	13.07	23.31	49.86	-26.55	AVG
7	0.5580	10.26	24.04	34.30	56.00	-21.70	QP
8	0.5580	10.26	3.78	14.04	46.00	-31.96	AVG
9	1.4060	10.43	25.29	35.72	56.00	-20.28	QP
10	1.4060	10.43	4.23	14.66	46.00	-31.34	AVG
11	3.3980	10.52	22.59	33.11	56.00	-22.89	QP
12	3.3980	10.52	2.88	13.40	46.00	-32.60	AVG

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 2: Full system for DH-IPC-HFW4431SP with Adapter + POE		
AC Power :	AC 230V/50Hz	Phase :	NEUTRAL
Equipment :	IP CAMERA	Model No :	DH-IPC-HFW4431SP
Temperature :	25°C	Humidity :	50%
Pressure(mbar) :	1002	Date :	2016/07/12



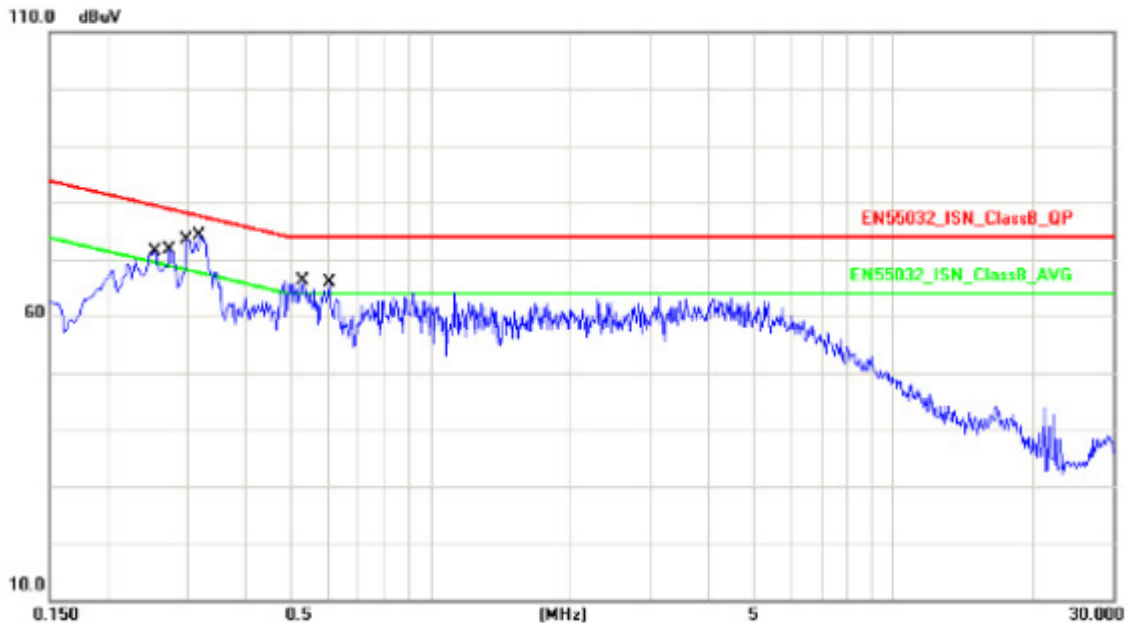
No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.1532	10.20	24.01	34.21	65.82	-31.61	QP
2	0.1532	10.20	4.42	14.62	55.82	-41.20	AVG
3	0.1712	10.21	23.21	33.42	64.90	-31.48	QP
4	0.1712	10.21	4.37	14.58	54.90	-40.32	AVG
5	0.1894	10.20	27.54	37.74	64.06	-26.32	QP
6	0.1894	10.20	6.12	16.32	54.06	-37.74	AVG
7	0.3251	10.24	39.21	49.45	59.57	-10.12	QP
8	0.3251	10.24	16.83	27.07	49.57	-22.50	AVG
9	0.8438	10.30	29.52	39.82	56.00	-16.18	QP
10	0.8438	10.30	7.92	18.22	46.00	-27.78	AVG
11	1.3884	10.42	29.39	39.81	56.00	-16.19	QP
12	1.3884	10.42	7.47	17.89	46.00	-28.11	AVG

Note: Measurement Level = Reading Level + Correct Factor



## Conducted Emission for Telecommunication Port Test Data

Test Mode :	Mode 1: Full system for DH-IPC-HFW4431SP (LAN 100Mbps)		
AC Power :	AC 110V/60Hz	Phase :	100Mbps
Equipment :	IP CAMERA	Model No :	DH-IPC-HFW4431SP
Temperature :	25°C	Humidity :	50%
Pressure(mbar) :	1002	Date :	2016/07/12

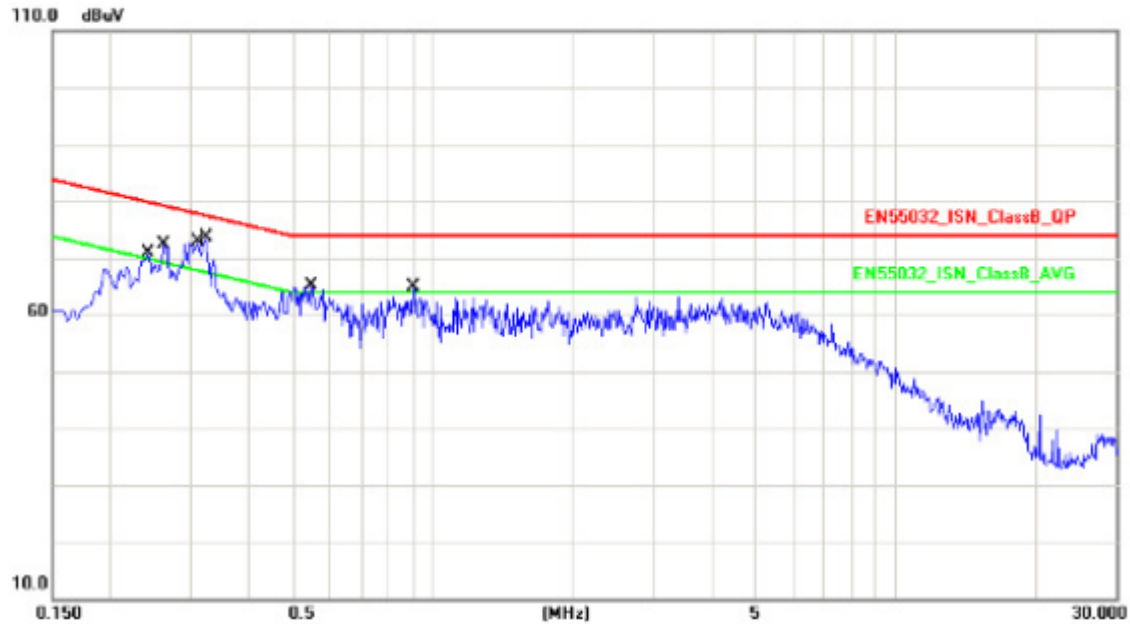


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2540	19.61	44.22	63.83	79.62	-15.79	QP
2	0.2540	19.61	28.38	47.99	69.62	-21.63	AVG
3	0.2740	19.61	44.34	63.95	78.99	-15.04	QP
4	0.2740	19.61	29.95	49.56	68.99	-19.43	AVG
5	0.2980	19.62	47.05	66.67	78.30	-11.63	QP
6	0.2980	19.62	32.66	52.28	68.30	-16.02	AVG
7	0.3180	19.62	48.78	68.40	77.76	-9.36	QP
8	0.3180	19.62	38.13	57.75	67.76	-10.01	AVG
9	0.5299	19.59	39.18	58.77	74.00	-15.23	QP
10	0.5299	19.59	23.43	43.02	64.00	-20.98	AVG
11	0.6060	19.58	37.56	57.14	74.00	-16.86	QP
12	0.6060	19.58	23.69	43.27	64.00	-20.73	AVG

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 2: Full system for DH-IPC-HFW4431SP (LAN 100Mbps)		
AC Power :	AC 230V/50Hz	Phase :	100Mbps
Equipment :	IP CAMERA	Model No :	DH-IPC-HFW4431SP
Temperature :	25°C	Humidity :	50%
Pressure(mbar) :	1002	Date :	2016/07/12



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2420	19.62	45.12	64.74	80.02	-15.28	QP
2	0.2420	19.62	28.93	48.55	70.02	-21.47	AVG
3	0.2620	19.61	45.60	65.21	79.36	-14.15	QP
4	0.2620	19.61	30.27	49.88	69.36	-19.48	AVG
5	0.3082	19.62	49.46	69.08	78.02	-8.94	QP
6	0.3082	19.62	35.16	54.78	68.02	-13.24	AVG
7	0.3220	19.62	48.36	67.98	77.65	-9.67	QP
8	0.3220	19.62	37.49	57.11	67.65	-10.54	AVG
9	0.5460	19.59	38.96	58.55	74.00	-15.45	QP
10	0.5460	19.59	23.60	43.19	64.00	-20.81	AVG
11	0.9060	19.38	36.97	56.35	74.00	-17.65	QP
12	0.9060	19.38	23.40	42.78	64.00	-21.22	AVG

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 3: Full system for DH-IPC-HFW4431SP (POE 100Mbps)		
DC Power :	POE 48V	Phase :	100Mbps
Equipment :	IP CAMERA	Model No :	DH-IPC-HFW4431SP
Temperature :	25°C	Humidity :	50%
Pressure(mbar) :	1002	Date :	2016/07/12



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.3082	19.62	48.51	68.13	78.02	-9.89	QP
2	0.3082	19.62	33.96	53.58	68.02	-14.44	AVG
3	0.3220	19.62	49.24	68.86	77.65	-8.79	QP
4	0.3220	19.62	36.20	55.82	67.65	-11.83	AVG
5	0.5460	19.59	37.48	57.07	74.00	-16.93	QP
6	0.5460	19.59	22.09	41.68	64.00	-22.32	AVG
7	0.9060	19.38	35.71	55.09	74.00	-18.91	QP
8	0.9060	19.38	23.06	42.44	64.00	-21.56	AVG
9	1.1180	19.29	44.23	63.52	74.00	-10.48	QP
10	1.1180	19.29	28.51	47.80	64.00	-16.20	AVG
11	2.7540	19.32	44.37	63.69	74.00	-10.31	QP
12	2.7540	19.32	28.79	48.11	64.00	-15.89	AVG

Note: Measurement Level = Reading Level + Correct Factor



## 5.1.2 RADIATED EMISSION

<b>Test Method:</b>	EN 55032		
<b>Limit:</b>	<b>Frequency</b>	<b>Limit(@3m)</b>	<b>Remark</b>
	30MHz-230MHz	40dBuV/m	QP value
	230MHz-1GHz	47dBuV/m	QP value
	1GHz-3GHz	50dBuV/m	Average value
		70dBuV/m	PK value
	3GHz-6GHz	54dBuV/m	Average value
		74dBuV/m	PK value
<b>Test Setup:</b>			

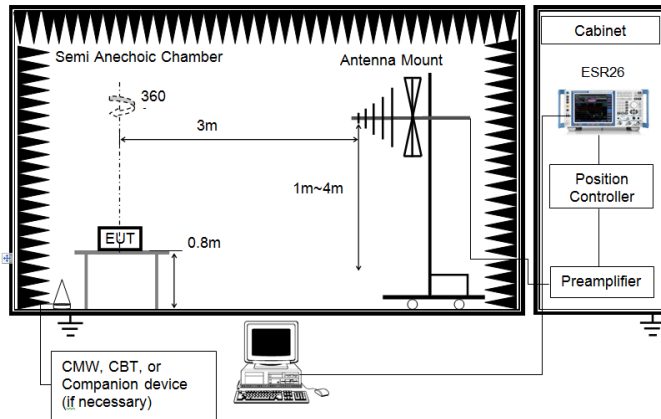


Figure 1. 30MHz to 1GHz

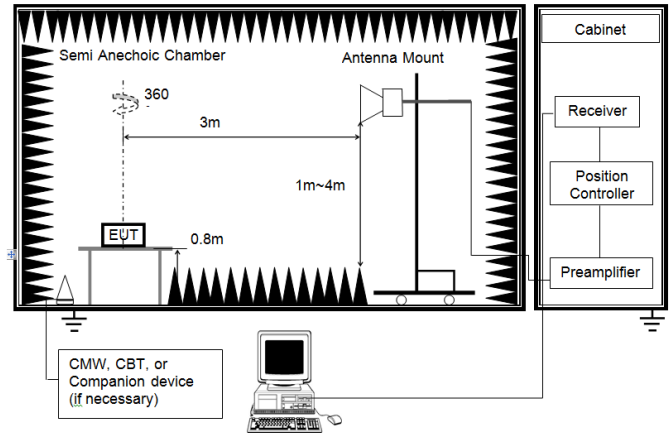


Figure 2. Above 1 GHz

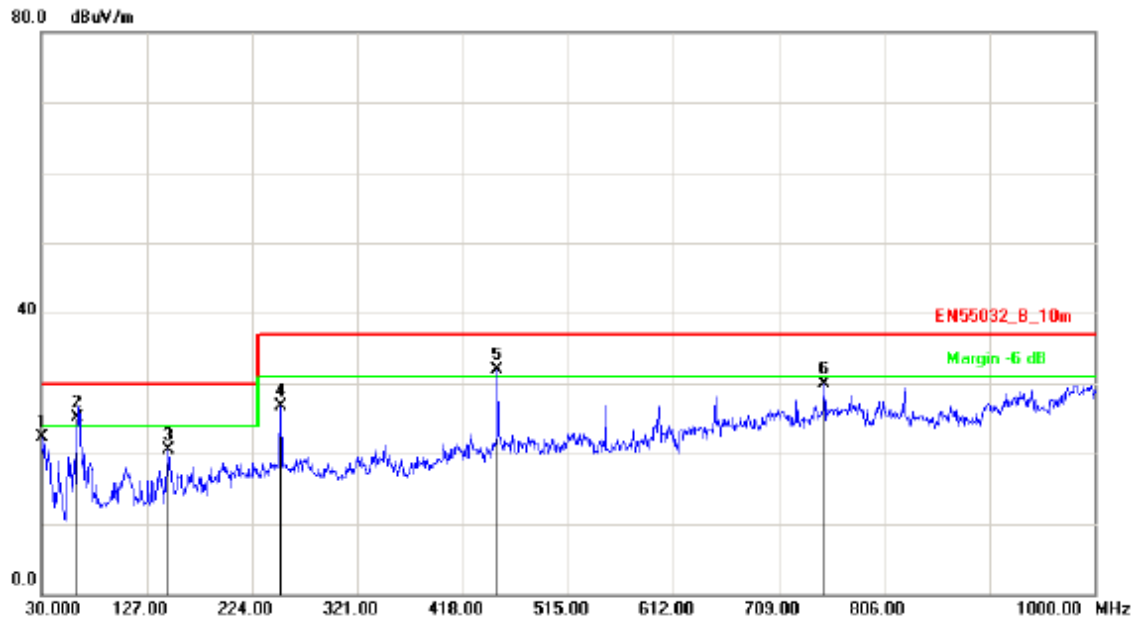
### Test Procedure:

- From 30 MHz to 1GHz test procedure as below:
  - The radiated emissions were tested in a semi-anechoic chamber.
  - The EUT is placed on a turntable, which is 0.8m above ground plane.
  - The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
  - EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
  - Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
  - And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
  - Repeat above procedures until the measurements for all frequencies are complete.
- Above 1GHz test procedure as below:
  - Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber.

### Measurement Data:

30MHz ~ 1000MHz

Test Mode :	Mode 1: Full system for DH-IPC-HFW4431SP with Adapter + POE		
AC Power :	AC 110V/60Hz	Ant. Polarization:	Horizontal
Equipment :	IP CAMERA	Model No :	DH-IPC-HFW4431SP
Temp :	24℃	Humidity :	54%
Pressure(mbar) :	1002	Date :	2016/07/01

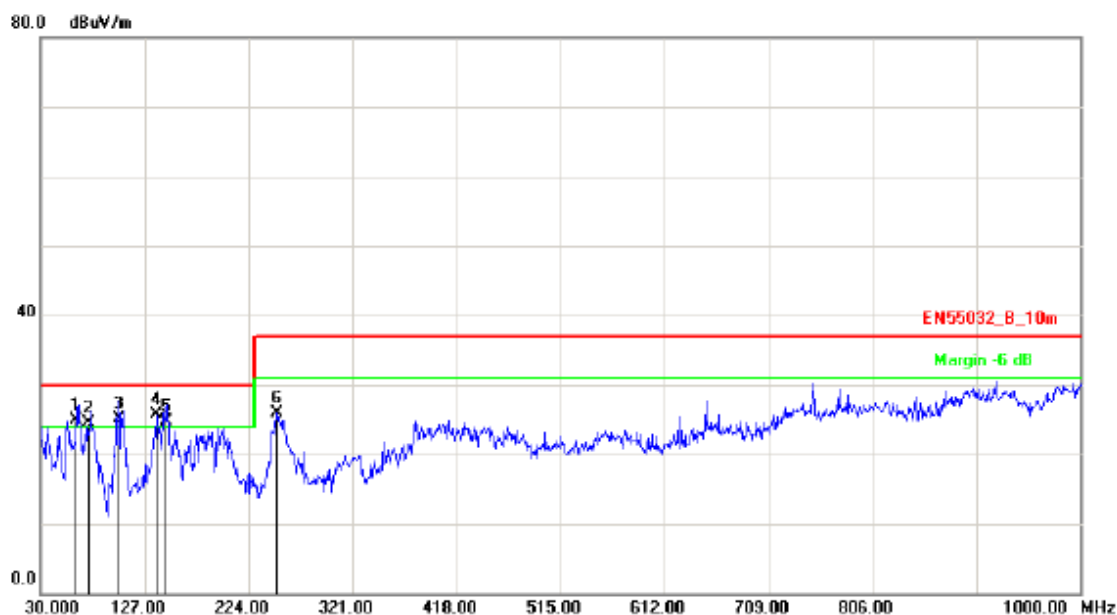


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	30.0000	-3.26	25.48	22.22	30.00	-7.78	QP	100	111
2	62.3900	-16.44	41.57	25.13	30.00	-4.87	QP	100	198
3	147.3700	-10.58	31.01	20.43	30.00	-9.57	QP	400	289
4	250.1899	-10.44	37.07	26.63	37.00	-10.37	QP	400	352
5	450.0099	-4.55	36.38	31.83	37.00	-5.17	QP	400	249
6	750.7100	1.10	28.88	29.98	37.00	-7.02	QP	100	78

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 1: Full system for DH-IPC-HFW4431SP with Adapter + POE		
AC Power :	AC 110V/60Hz	Ant. Polarization:	Vertical
Equipment :	IP CAMERA	Model No :	DH-IPC-HFW4431SP
Temp :	24℃	Humidity :	54%
Pressure(mbar) :	1002	Date :	2016/07/01

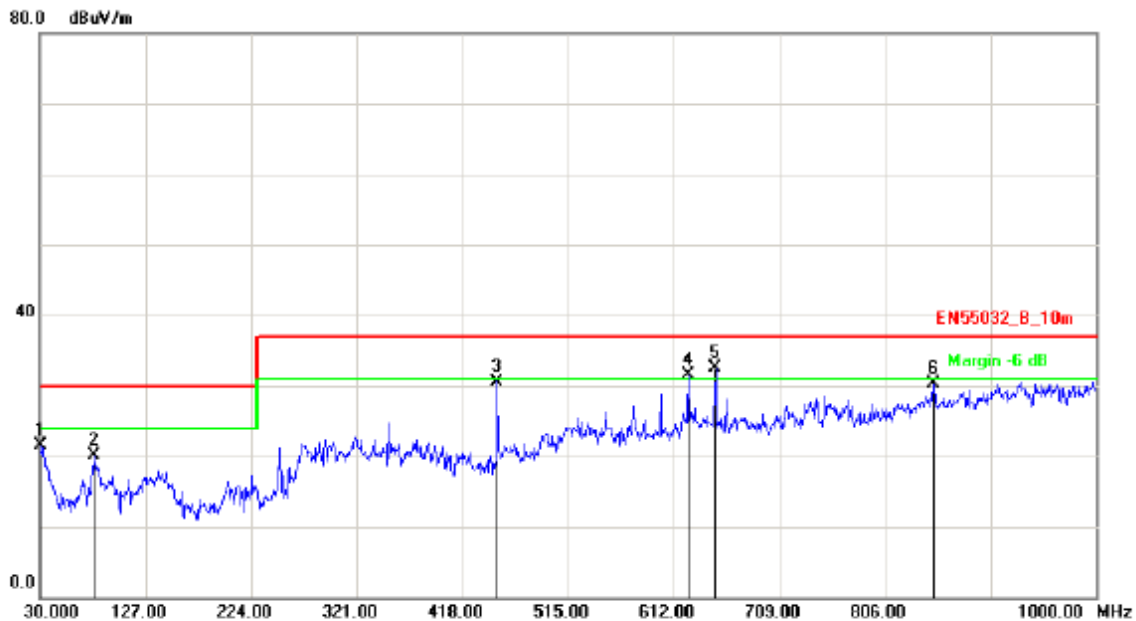


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	63.2200	-16.36	41.33	24.97	30.00	-5.03	QP	100	360
2	74.9800	-15.98	40.51	24.53	30.00	-5.47	QP	100	360
3	103.2400	-13.11	38.26	25.15	30.00	-4.85	QP	100	152
4	137.6699	-10.32	36.05	25.73	30.00	-4.27	QP	100	113
5	147.5900	-10.59	35.28	24.69	30.00	-5.31	QP	400	29
6	250.1899	-10.44	36.30	25.86	37.00	-11.14	QP	100	218

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 2: Full system for DH-IPC-HFW4431SP with Adapter + POE		
AC Power :	AC 230V/50Hz	Ant. Polarization:	Horizontal
Equipment :	IP CAMERA	Model No :	DH-IPC-HFW4431SP
Temp :	24℃	Humidity :	54%
Pressure(mbar) :	1002	Date :	2016/07/01

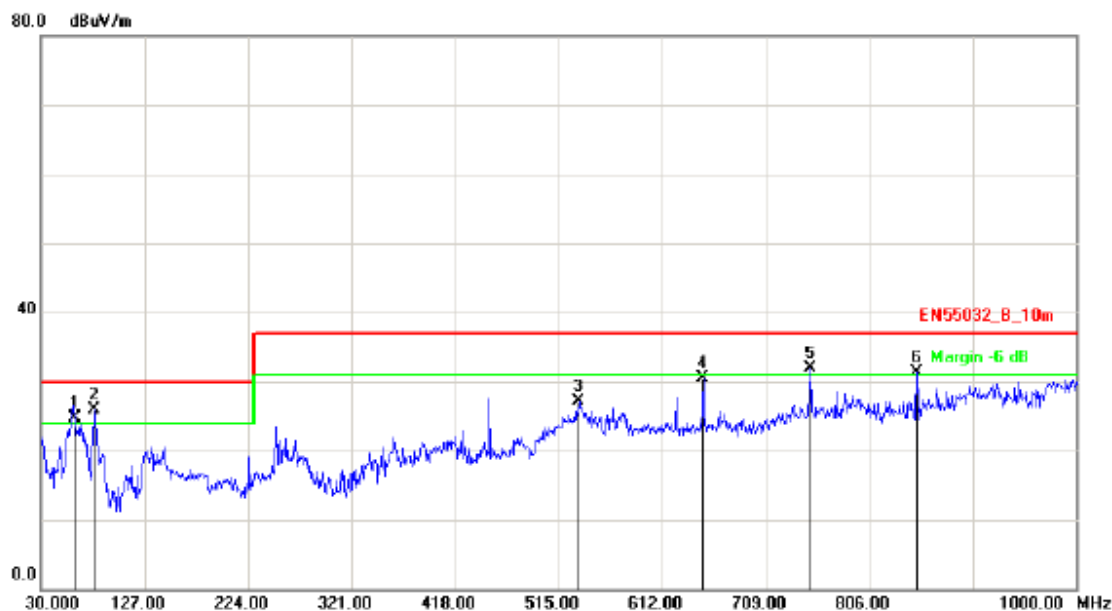


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	30.0000	-3.26	24.68	21.42	30.00	-8.58	QP	400	269
2	79.4699	-16.21	36.27	20.06	30.00	-9.94	QP	100	154
3	450.0099	-4.55	35.15	30.60	37.00	-6.40	QP	100	29
4	625.5800	-0.85	32.36	31.51	37.00	-5.49	QP	100	348
5	650.7998	-0.30	32.80	32.50	37.00	-4.50	QP	100	244
6	850.6200	2.55	27.68	30.23	37.00	-6.77	QP	100	213

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 2: Full system for DH-IPC-HFW4431SP with Adapter + POE		
AC Power :	AC 230V/50Hz	Ant. Polarization:	Vertical
Equipment :	IP CAMERA	Model No :	DH-IPC-HFW4431SP
Temp :	24℃	Humidity :	54%
Pressure(mbar) :	1002	Date :	2016/07/01

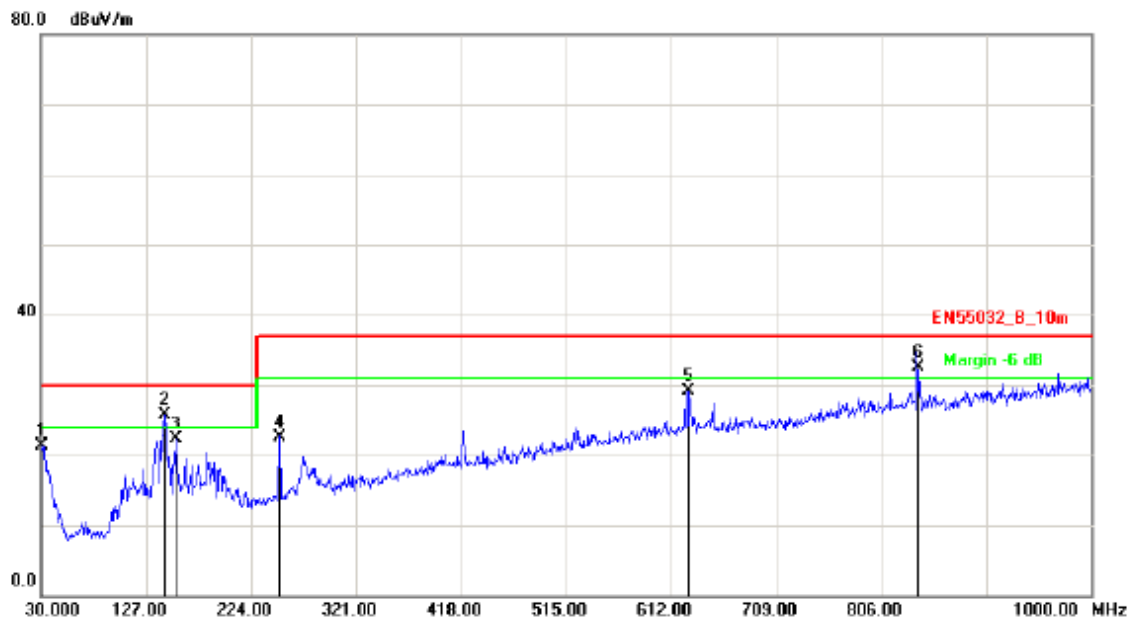


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	61.3640	-16.54	41.29	24.75	30.00	-5.25	QP	400	111
2	80.4399	-16.24	42.16	25.92	30.00	-4.08	QP	100	12
3	534.3999	-2.33	29.35	27.02	37.00	-9.98	QP	400	269
4	650.7999	-0.30	30.72	30.42	37.00	-6.58	QP	100	284
5	750.7100	1.10	30.78	31.88	37.00	-5.12	QP	100	89
6	850.6200	2.55	28.67	31.22	37.00	-5.78	QP	400	318

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 3: Full system for DH-IPC-HFW4431SP with POE		
DC Power :	POE 48V	Ant. Polarization:	Horizontal
Equipment :	IP CAMERA	Model No :	DH-IPC-HFW4431SP
Temp :	24°C	Humidity :	54%
Pressure(mbar) :	1002	Date :	2016/07/01

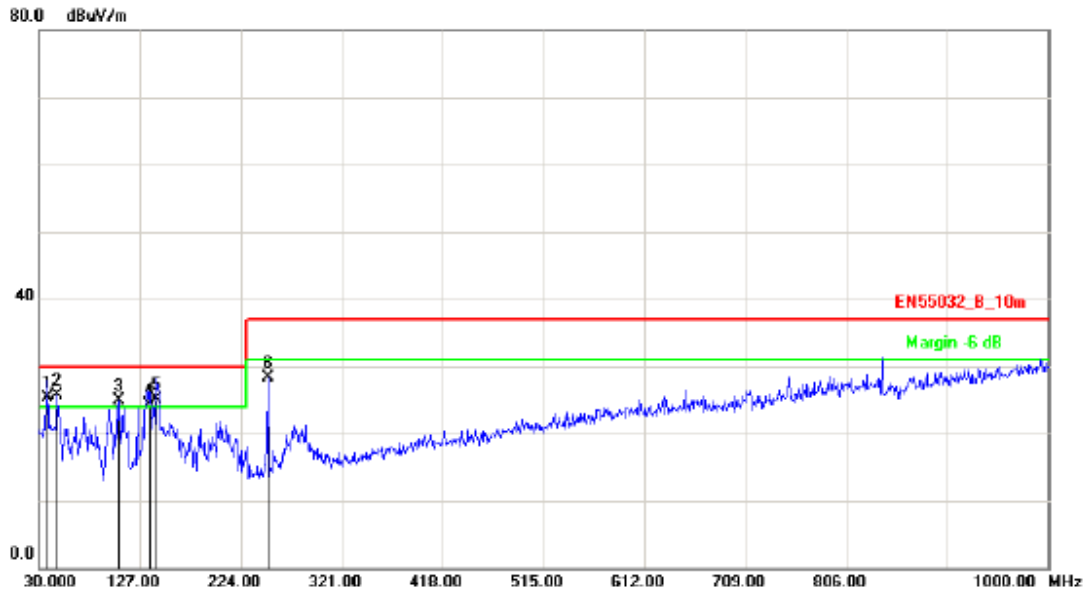


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	30.0000	-3.26	24.52	21.26	30.00	-8.74	QP	400	219
2	144.4600	-10.52	36.27	25.75	30.00	-4.25	QP	400	182
3	155.1299	-10.75	33.09	22.34	30.00	-7.66	QP	400	193
4	250.1899	-10.44	33.04	22.60	37.00	-14.40	QP	400	103
5	628.4900	-0.79	29.95	29.16	37.00	-7.84	QP	100	126
6	839.6800	2.47	30.01	32.48	37.00	-4.52	QP	100	245

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 3: Full system for DH-IPC-HFW4431SP with POE		
DC Power :	POE 48V	Ant. Polarization:	Vertical
Equipment :	IP CAMERA	Model No :	DH-IPC-HFW4431SP
Temp :	24℃	Humidity :	54%
Pressure(mbar) :	1002	Date :	2016/07/01



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	37.8900	-8.96	34.20	25.24	30.00	-4.76	QP	100	0
2	47.4600	-14.77	40.46	25.69	30.00	-4.31	QP	100	18
3	106.6299	-12.39	37.36	24.97	30.00	-5.03	QP	400	351
4	136.7400	-10.28	34.57	24.29	30.00	-5.71	QP	100	284
5	143.2600	-10.49	35.62	25.13	30.00	-4.87	QP	100	203
6	250.1899	-10.44	38.74	28.30	37.00	-8.70	QP	400	163

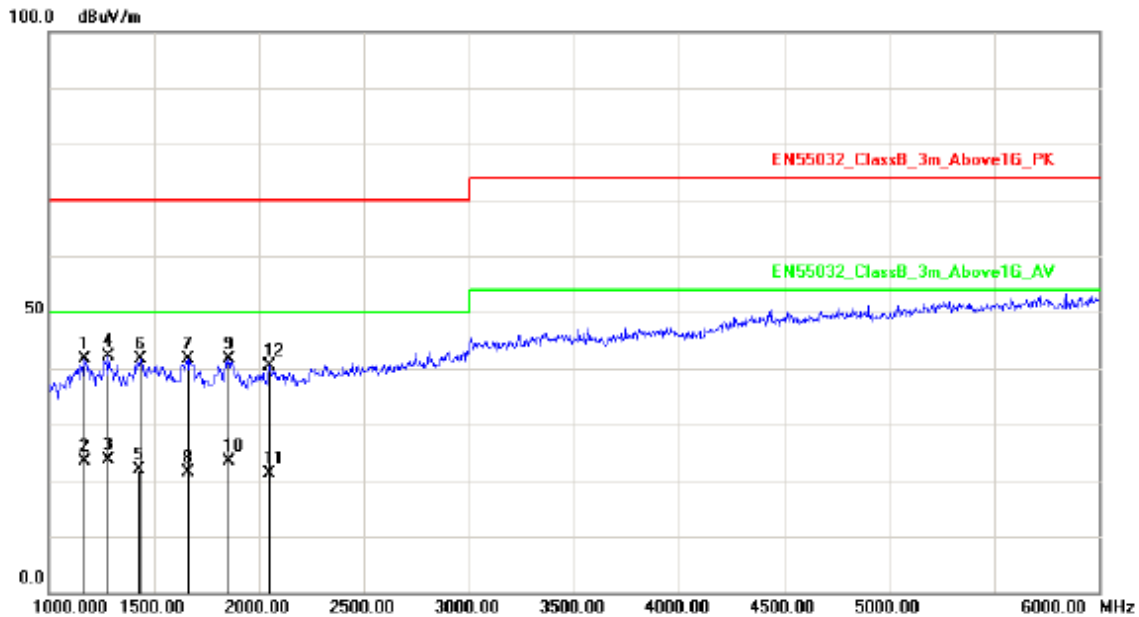
Note: Measurement Level = Reading Level + Correct Factor





## Above 1000MHz

Test Mode :	Mode 1: Full system for DH-IPC-HFW4431SP with Adapter + POE		
AC Power :	AC 110V/60Hz	Ant. Polarization:	Horizontal
Equipment :	IP CAMERA	Model No :	DH-IPC-HFW4431SP
Temp :	24℃	Humidity :	54%
Pressure(mbar) :	1002	Date :	2016/07/01



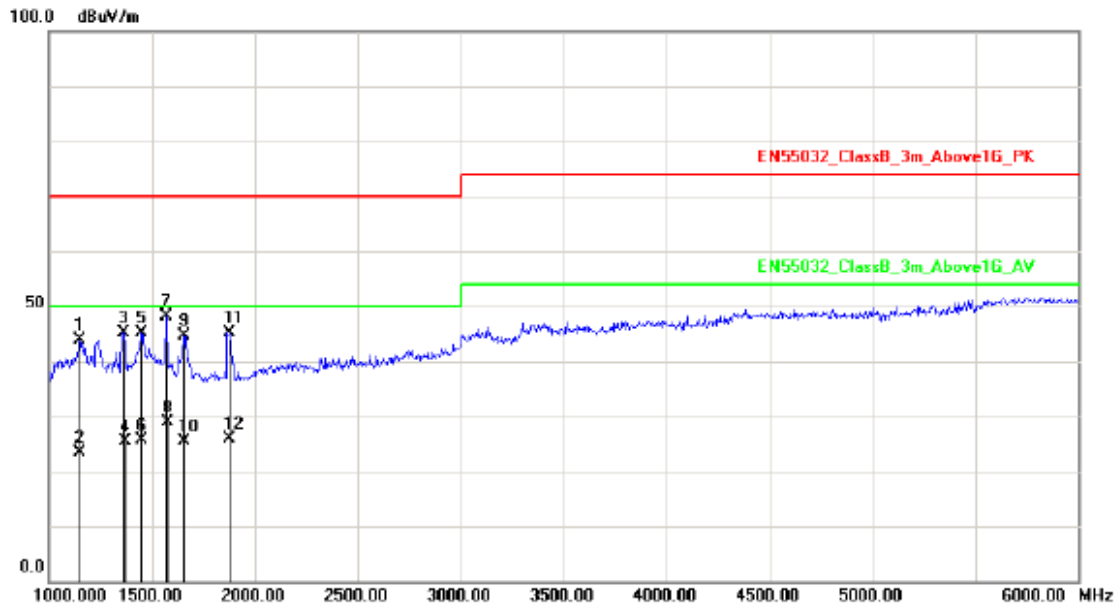
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	1170.000	-4.84	46.54	41.70	70.00	-28.30	peak	200	162
2	1172.000	-4.83	28.11	23.28	50.00	-26.72	AVG	200	162
3	1283.000	-4.09	27.63	23.54	50.00	-26.46	AVG	100	57
4	1285.000	-4.08	46.14	42.06	70.00	-27.94	peak	100	57
5	1433.000	-3.09	24.85	21.76	50.00	-28.24	AVG	100	186
6	1435.000	-3.07	44.62	41.55	70.00	-28.45	peak	100	186
7	1660.000	-2.18	43.75	41.57	70.00	-28.43	peak	200	360
8	1664.000	-2.17	23.64	21.47	50.00	-28.53	AVG	200	360
9	1855.000	-1.62	43.13	41.51	70.00	-28.49	peak	100	221
10	1859.000	-1.61	24.87	23.26	50.00	-26.74	AVG	100	221
11	2047.000	-0.96	22.15	21.19	50.00	-28.81	AVG	200	0
12	2050.000	-0.94	41.28	40.34	70.00	-29.66	peak	200	0

Note: Measurement Level = Reading Level + Correct Factor





Test Mode :	Mode 1: Full system for DH-IPC-HFW4431SP with Adapter + POE		
AC Power :	AC 110V/60Hz	Ant. Polarization:	Vertical
Equipment :	IP CAMERA	Model No :	DH-IPC-HFW4431SP
Temp :	24°C	Humidity :	54%
Pressure(mbar) :	1002	Date :	2016/07/01

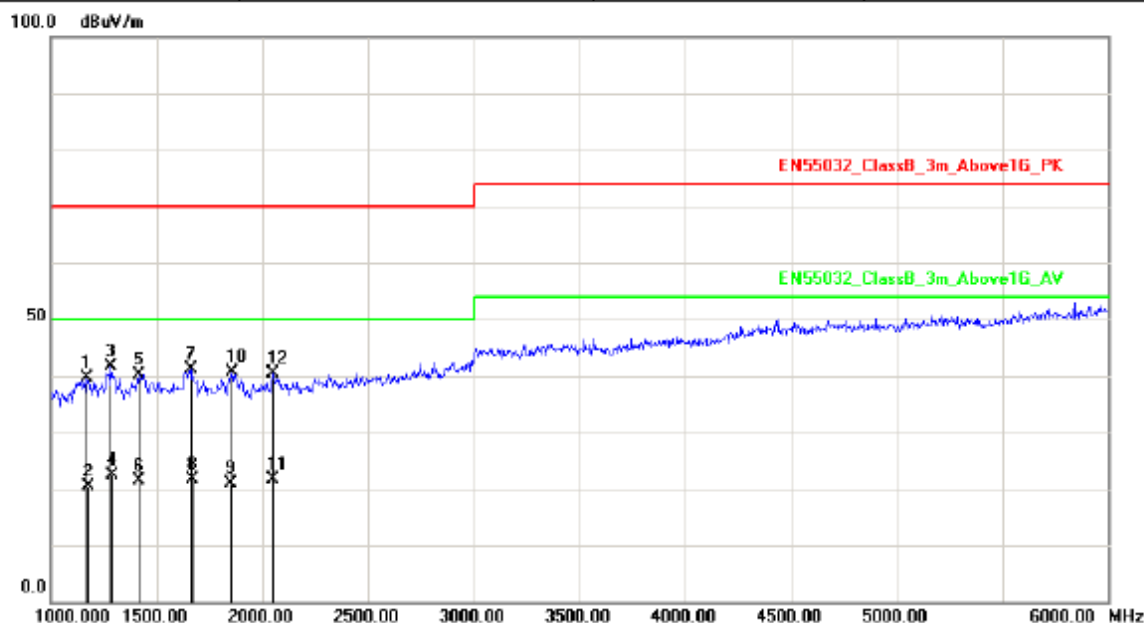


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	1150.000	-4.98	48.79	43.81	70.00	-26.19	peak	100	241
2	1153.000	-4.96	28.39	23.43	50.00	-26.57	AVG	100	241
3	1365.000	-3.54	48.77	45.23	70.00	-24.77	peak	200	29
4	1369.000	-3.52	28.94	25.42	50.00	-24.58	AVG	200	29
5	1450.000	-2.97	48.05	45.08	70.00	-24.92	peak	100	357
6	1452.000	-2.96	28.61	25.65	50.00	-24.35	AVG	100	357
7	1570.000	-2.44	50.66	48.22	70.00	-21.78	peak	200	195
8	1576.000	-2.42	31.20	28.78	50.00	-21.22	AVG	200	195
9	1655.000	-2.19	46.73	44.54	70.00	-25.46	peak	100	118
10	1657.000	-2.19	27.52	25.33	50.00	-24.67	AVG	100	118
11	1875.000	-1.56	46.73	45.17	70.00	-24.83	peak	100	284
12	1876.000	-1.56	27.49	25.93	50.00	-24.07	AVG	100	284

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 2: Full system for DH-IPC-HFW4431SP with Adapter + POE		
AC Power :	AC 230V/50Hz	Ant. Polarization:	Horizontal
Equipment :	IP CAMERA	Model No :	DH-IPC-HFW4431SP
Temp :	24°C	Humidity :	54%
Pressure(mbar) :	1002	Date :	2016/07/01

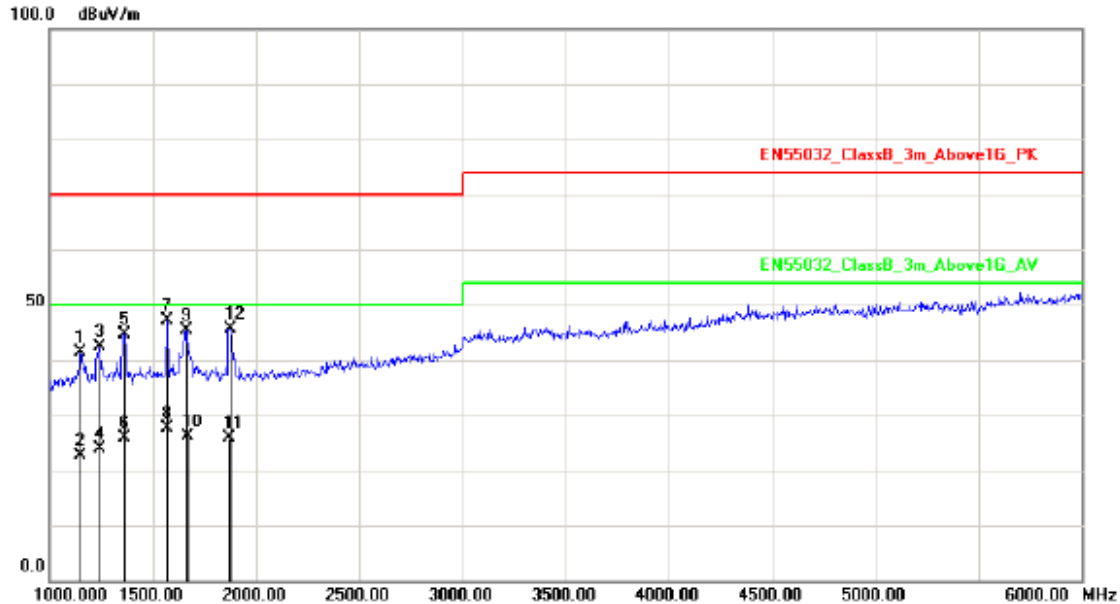


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	1170.000	-4.84	44.54	39.70	70.00	-30.30	peak	100	354
2	1176.000	-4.80	25.12	20.32	50.00	-29.68	AVG	100	354
3	1285.000	-4.08	45.64	41.56	70.00	-28.44	peak	200	193
4	1289.000	-4.05	26.34	22.29	50.00	-27.71	AVG	200	193
5	1415.000	-3.21	43.32	40.11	70.00	-29.89	peak	200	247
6	1416.000	-3.20	24.52	21.32	50.00	-28.68	AVG	200	247
7	1660.000	-2.18	43.25	41.07	70.00	-28.93	peak	100	19
8	1667.000	-2.16	23.87	21.71	50.00	-28.29	AVG	100	19
9	1853.000	-1.62	22.61	20.99	50.00	-29.01	AVG	200	48
10	1855.000	-1.62	42.13	40.51	70.00	-29.49	peak	200	48
11	2047.000	-0.96	22.49	21.53	50.00	-28.47	AVG	200	206
12	2050.000	-0.94	41.28	40.34	70.00	-29.66	peak	200	206

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 2: Full system for DH-IPC-HFW4431SP with Adapter + POE		
AC Power :	AC 230V/50Hz	Ant. Polarization:	Vertical
Equipment :	IP CAMERA	Model No :	DH-IPC-HFW4431SP
Temp :	24°C	Humidity :	54%
Pressure(mbar) :	1002	Date :	2016/07/01

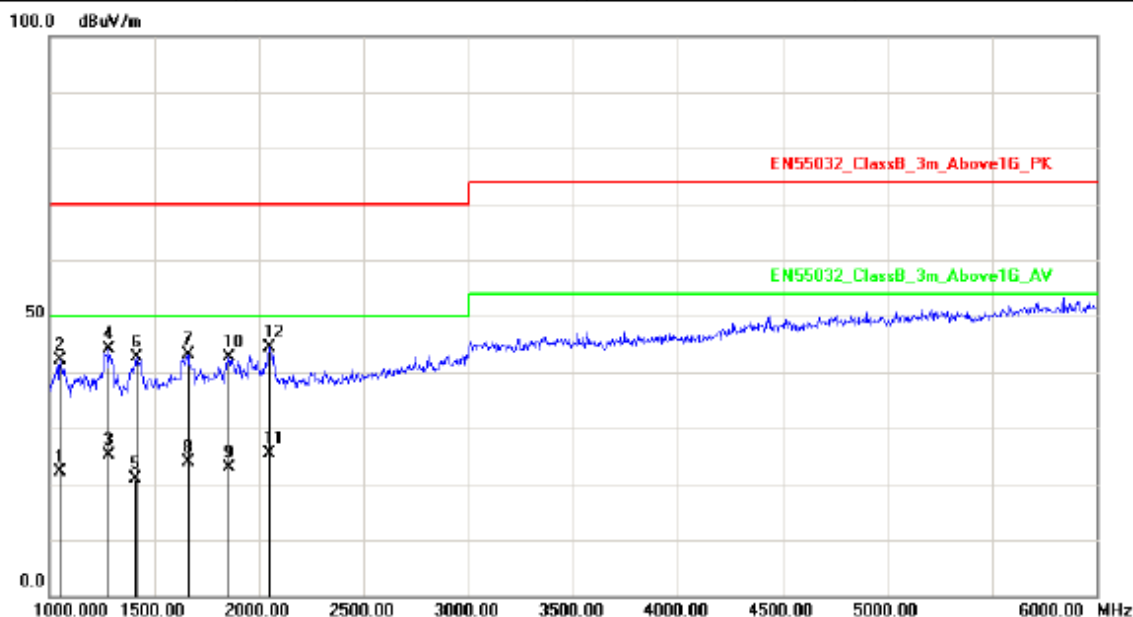


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	1150.000	-4.98	46.29	41.31	70.00	-28.69	peak	100	0
2	1152.000	-4.96	27.51	22.55	50.00	-27.45	AVG	100	0
3	1240.000	-4.38	46.82	42.44	70.00	-27.56	peak	100	21
4	1243.000	-4.36	28.32	23.96	50.00	-26.04	AVG	100	21
5	1365.000	-3.54	48.27	44.73	70.00	-25.27	peak	100	360
6	1366.000	-3.54	29.44	25.90	50.00	-24.10	AVG	100	360
7	1570.000	-2.44	49.66	47.22	70.00	-22.78	peak	200	294
8	1572.000	-2.43	30.02	27.59	50.00	-22.41	AVG	200	294
9	1665.000	-2.16	47.60	45.44	70.00	-24.56	peak	200	118
10	1669.000	-2.15	28.16	26.01	50.00	-23.99	AVG	200	118
11	1873.000	-1.57	27.39	25.82	50.00	-24.18	AVG	100	227
12	1875.000	-1.56	47.23	45.67	70.00	-24.33	peak	100	227

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 3: Full system for DH-IPC-HFW4431SP with POE		
DC Power :	POE 48V	Ant. Polarization:	Horizontal
Equipment :	IP CAMERA	Model No :	DH-IPC-HFW4431SP
Temp :	24℃	Humidity :	54%
Pressure(mbar) :	1002	Date :	2016/07/01

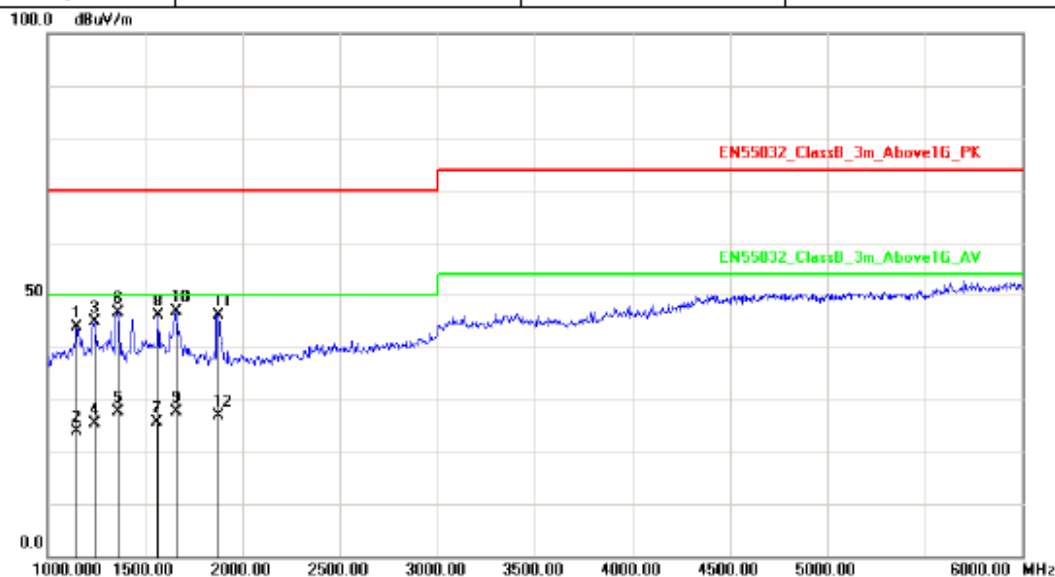


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	1047.000	-5.67	27.89	22.22	50.00	-27.78	AVG	200	214
2	1050.000	-5.65	47.77	42.12	70.00	-27.88	peak	200	214
3	1284.000	-4.08	29.33	25.25	50.00	-24.75	AVG	200	115
4	1285.000	-4.08	48.14	44.06	70.00	-25.94	peak	200	115
5	1413.000	-3.22	24.18	20.96	50.00	-29.04	AVG	100	284
6	1415.000	-3.21	45.82	42.61	70.00	-27.39	peak	100	284
7	1660.000	-2.18	45.25	43.07	70.00	-26.93	peak	100	196
8	1662.000	-2.17	26.03	23.86	50.00	-26.14	AVG	100	196
9	1854.000	-1.62	24.57	22.95	50.00	-27.05	AVG	100	0
10	1855.000	-1.62	44.13	42.51	70.00	-27.49	peak	100	0
11	2049.000	-0.95	26.30	25.35	50.00	-24.65	AVG	200	354
12	2050.000	-0.94	45.28	44.34	70.00	-25.66	peak	200	354

Note: Measurement Level = Reading Level + Correct Factor



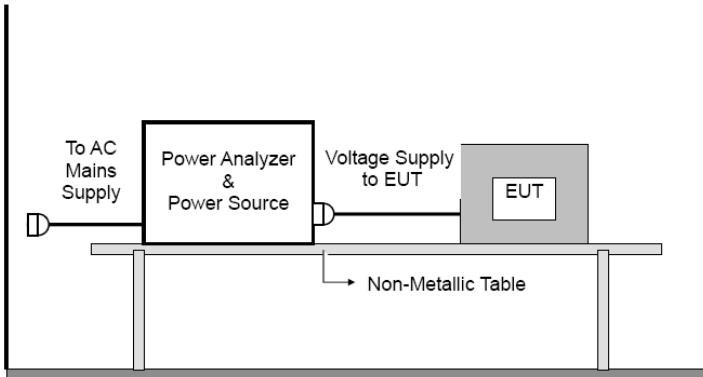
Test Mode :	Mode 3: Full system for DH-IPC-HFW4431SP with POE		
DC Power :	POE 48V	Ant. Polarization:	Vertical
Equipment :	IP CAMERA	Model No :	DH-IPC-HFW4431SP
Temp :	24°C	Humidity :	54%
Pressure(mbar) :	1002	Date :	2016/07/01



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	1150.000	-4.98	48.79	43.81	70.00	-26.19	peak	200	163
2	1153.000	-4.96	28.79	23.83	50.00	-26.17	AVG	200	163
3	1240.000	-4.38	49.32	44.94	70.00	-25.06	peak	100	2
4	1241.000	-4.37	29.68	25.31	50.00	-24.69	AVG	100	2
5	1362.000	-3.56	31.20	27.64	50.00	-22.36	AVG	100	191
6	1365.000	-3.54	50.27	46.73	70.00	-23.27	peak	100	191
7	1565.000	-2.45	28.06	25.61	50.00	-24.39	AVG	200	341
8	1570.000	-2.44	48.66	46.22	70.00	-23.78	peak	200	341
9	1663.000	-2.17	29.87	27.70	50.00	-22.30	AVG	100	0
10	1665.000	-2.16	49.10	46.94	70.00	-23.06	peak	100	0
11	1875.000	-1.56	47.73	46.17	70.00	-23.83	peak	100	274
12	1877.000	-1.55	28.41	26.86	50.00	-23.14	AVG	100	274

Note: Measurement Level = Reading Level + Correct Factor

### 5.1.3 FLICKER TEST

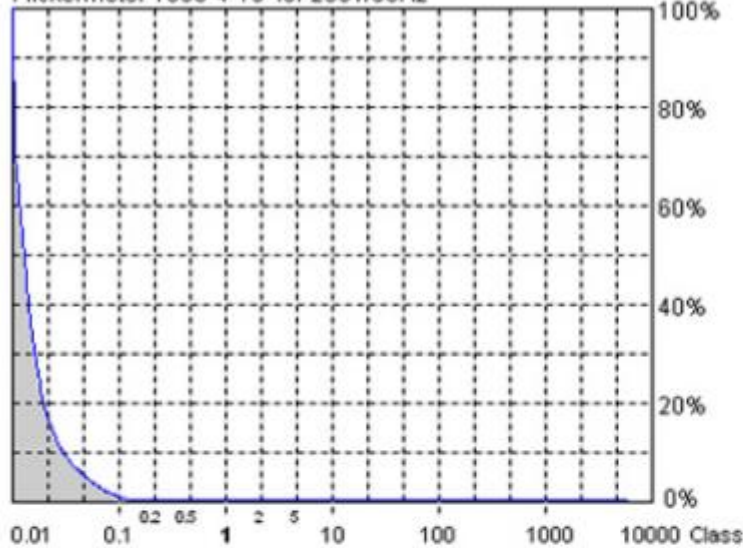
<b>Test Method:</b>	EN 61000-3-3		
<b>Limits:</b>	<b>Test items</b>	<b>Limits(EN61000-3-3)</b>	<b>Descriptions</b>
	<b>P<sub>st</sub></b>	$\leq 1.0$ , T <sub>p</sub> =10min	short-term flicker indicator
	<b>P<sub>lt</sub></b>	$\leq 0.65$ , T <sub>p</sub> =2h	long-term flicker indicator
	<b>d<sub>c</sub></b>	$\leq 3.3\%$	relative steady-state voltage change
	<b>d<sub>max</sub></b>	$\leq 4\%$ (or 6% <sup>Note(1)</sup> , 7% <sup>Note(2)</sup> )	maximum relative voltage change:
	<b>d<sub>(t)</sub></b>	$\leq 3.3\%$ , more than 500ms	relative voltage change characteristic
<b>Test Setup:</b>	 <p>1. The test supply voltage (open-circuit voltage) was the rated voltage of the EUT. The Test voltage: was maintained within <math>\pm 2\%</math> of the nominal value. The frequency was 50 Hz <math>\pm 0.5\%</math>.</p> <p>2. The voltage fluctuations and flicker were measured at the supply terminals of the EUT.</p> <p>3. The observation period, T<sub>p</sub>, for the assessment of flicker values by flicker measurement, flicker simulation, or analytical method was:</p> <ul style="list-style-type: none"> <li>— for P<sub>st</sub>, T<sub>p</sub> = 10 min;</li> <li>— for P<sub>lt</sub>, T<sub>p</sub> = 2 h.</li> </ul> <p>The observation period included that part of the whole operation cycle in which the EUT produces the most unfavorable sequence of voltage changes.</p>		





## Measurement Data:

Flickermeter 1000-4-15 for 230V/50Hz



Flicker Emission - IEC 61000-3-3, EN 61000-3-3, (EN60555-3)

Urms = 230.5 V P = 3.276 W  
Irms = 0.031 A pf = 0.451

Test completed, Result: PASSED

2016-6-30 13:50:30 harmonic.hsu

Range: 0.25 A  
V-nom: 230 V  
TestTime: 10 min (100%)

HAR-1000 EMC-Parber

Full Bar : Actual Values

Empty Bar : Maximum Values

Circles : Average Values

Blue : Current , Green : Voltage , Red : Failed

Urms = 230.5V Freq = 50.000 Range: 0.25 A

Irms = 0.031A Ipk = 0.158A cf = 5.027

P = 3.276W S = 7.259VA pf = 0.451

Test - Time : 1 x 10min = 10min ( 100 %)

LIN (Line Impedance Network) : No LIN

Limits : Plt : 0.65 Pst : 1.00  
dmax : 4.00 % dc : 3.30 %  
dtLim: 3.30 % dt>Lim: 500ms

Test completed, Result: PASSED



## 5.2 ELECTROMAGNETIC SUSCEPTIBILITY (IMMUNITY)

### Performance Criteria Description

<b>Criterion A:</b>
<p>The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.</p>
<b>Criterion B:</b>
<p>The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.</p>
<b>Criterion C:</b>
<p>Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.</p>



### 5.2.1 ELECTROSTATIC DISCHARGE (ESD)

<b>Test Method:</b>	EN61000-4-2
<b>Criterion Required:</b>	B
<b>Discharge Impedance:</b>	330 $\Omega$ / 150 pF
<b>Polarity:</b>	Positive & Negative
<b>Number of Discharge:</b>	Minimum 10 times at each test point (for EN50130-4) At least 200 discharges and 100 each for polarity (for EN55024)
<b>Discharge Mode:</b>	Single Discharge
<b>Discharge Period:</b>	1 second minimum
<b>Equipment Used:</b>	Refer to section 5 for details.
<b>Test Setup:</b>	<p style="text-align: center;">Test set-up for tabletop equipment</p>
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1) Contact discharges to the conductive surfaces and to coupling planes: Air discharge at slots and apertures, and insulating surfaces: On those parts of the EUT where it was not possible to perform contact discharge testing, the equipment was investigated to identify user accessible points where breakdown may occur. This investigation was restricted to those areas normally handled by the user. A minimum of 10 single air discharges were applied to the selected test point for each such area. The application of electrostatic discharges to the contacts of open connectors was not required by this standard.</li> <li>2) The EUT was put on a 0.8m high wooden table for table-top equipment or 0.1m high for floor standing equipment standing on the ground reference plane (GRP).</li> <li>3) A horizontal coupling plane(HCP) 1.6m by 0.8m in size was placed on the table, and the EUT with its cables were isolated from the HCP by an insulating support thick than 0.5mm. The VCP 0.5m by 0.5m in size &amp; HCP were constructed from the same material type &amp; think mess as that of the</li> </ol>



	<p>GRP, and connected to the GRP via a 470k<math>\Omega</math> resistor at each end. The distance between EUT and any of the other metallic surfaces excepted the GRP, HCP and VCP was greater than 1m.</p> <p>4) During the contact discharges, the tip of the discharge electrode was touch the EUT before the discharge switch is operated. During the air discharges, the round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT.</p> <p>5) After each discharge, the ESD generator was removed from the EUT, the generator was then retrigged for a new single discharge. For ungrounded product, a discharge cable with two resistances was used after each discharge to remove remnant electrostatic voltage. 10 times of each polarity single discharge were applied to HCP and VCP.</p>
--	--



## Test Results:

Test Mode 1

For EN 55024: 2010+A1:2015

Test Voltage: AC 230V/50Hz

	Contact Discharge								Air Discharge							
	25 times / each								10 times / each							
Voltage	2 kV		4 kV		6 kV		8 kV		2 kV		4 kV		8 kV		10 kV	
Point\Polarity	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
HCP	A	A	A	A	---	---	---	---	---	---	---	---	---	---	---	---
VCP	A	A	A	A	---	---	---	---	---	---	---	---	---	---	---	---
1,2,3,24,25	---	---	---	---	---	---	---	---	A	A	A	A	A	A	---	---
4-23	A	A	A	A	---	---	---	---	---	---	---	---	---	---	---	---

For EN 50130-4:2011+A1:2014

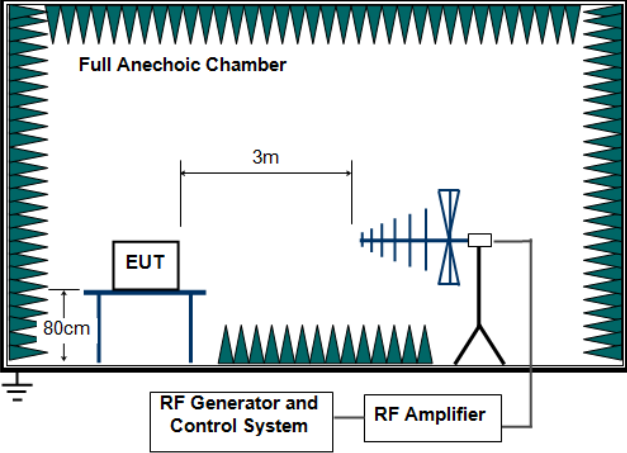
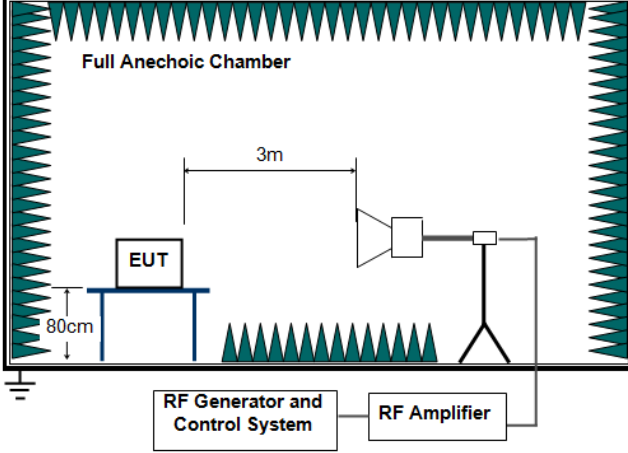
Test Voltage: AC 230V/50Hz																
	Contact Discharge								Air Discharge							
	25 times / each								10 times / each							
Voltage	2 kV		4 kV		6 kV		8 kV		2 kV		4 kV		8 kV		10 kV	
Point\Polarity	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
HCP	A	A	A	A	A	A	---	---	---	---	---	---	---	---	---	---
VCP	A	A	A	A	A	A	---	---	---	---	---	---	---	---	---	---
1,2,3,24,25	---	---	---	---	---	---	---	---	A	A	A	A	A	A	---	---
4-23	A	A	A	A	A	A	---	---	---	---	---	---	---	---	---	---



Test Voltage: AC 195.5V/50Hz																
	Contact Discharge								Air Discharge							
	25 times / each								10 times / each							
Voltage	2 kV		4 kV		6 kV		8 kV		2 kV		4 kV		8 kV		10 kV	
Point\Polarity	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
HCP	A	A	A	A	A	A	---	---	---	---	---	---	---	---	---	---
VCP	A	A	A	A	A	A	---	---	---	---	---	---	---	---	---	---
1,2,3,24,25	---	---	---	---	---	---	---	---	A	A	A	A	A	A	---	---
4-23	A	A	A	A	A	A	---	---	---	---	---	---	---	---	---	---

Test Voltage: AC 253V/50Hz																
	Contact Discharge								Air Discharge							
	25 times / each								10 times / each							
Voltage	2 kV		4 kV		6 kV		8 kV		2 kV		4 kV		8 kV		10 kV	
Point\Polarity	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
HCP	A	A	A	A	A	A	---	---	---	---	---	---	---	---	---	---
VCP	A	A	A	A	A	A	---	---	---	---	---	---	---	---	---	---
1,2,3,24,25	---	---	---	---	---	---	---	---	A	A	A	A	A	A	---	---
4-23	A	A	A	A	A	A	---	---	---	---	---	---	---	---	---	---

## 5.2.2 RADIATED IMMUNITY

<b>Test Method:</b>	EN 61000-4-3
<b>Criterion Required:</b>	A
<b>Test Setup:</b>	
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Figure 1. 80MHz to 1GHz ,</p> </div> <div style="text-align: center;">  <p>Figure 2 1GHz to 2.7GHz</p> </div> </div>	
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1) For table-top equipment, the EUT was placed in the chamber on a non-conductive table 0.8m high. For arrangement of floor-standing equipment, the EUT was mounted on a non-conductive support 0.1m above the supporting plane. For human body-mounted equipment, the EUT may be tested in the same manner as table top items.</li> <li>2) If possible, a minimum of 1 m of cable is exposed to the electromagnetic field. Excess length of cables interconnecting units of the EUT shall be bundled low-inductively in the approximate center of the cable to form a bundle 30 cm to 40 cm in length.</li> <li>3) The EUT was initially placed with one face coincident with the calibration plane. The EUT face being illuminated was contained within the UFA (Uniform Field Area).</li> <li>4) The frequency ranges to be considered were swept with the signal modulated and pausing to adjust the RF signal level or to switch oscillators and antennas as necessary. Where the frequency range was swept incrementally, the step size was not exceed 1% of the preceding frequency value.</li> <li>5) The dwell time of the amplitude modulated carrier at each frequency was not be less than the time necessary for the EUT to be exercised and to respond, and was not less than 0.5s.</li> <li>6) The test normally was performed with the generating antenna facing each side of the EUT.</li> <li>7) The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and</li> </ol>



	<p>again with the antenna positioned horizontally.</p> <p>8) The EUT was performed in a configuration to actual installation conditions, a video camera, test data and/or an audio monitor were used to monitor the performance of the EUT.</p>
--	---

## Test Results:

Test Mode 1

For EN 55024: 2010+A1:2015

Test Voltage: AC 230V/50Hz

Modulation : AM 80% , 1KHz sine wave , Dwell time: 3.0 S				
Frequency Step Size : 1 % of preceding frequency value				
Frequency (MHz)	Antenna Polarization	face	Field strength (V/m)	Result
80~1000	Horizontal &Vertical	Front	3 V/m	A
80~1000	Horizontal &Vertical	Rear	3 V/m	A
80~1000	Horizontal &Vertical	Left	3 V/m	A
80~1000	Horizontal &Vertical	Right	3 V/m	A

For EN 50130-4:2011+A1:2014

Test Voltage: AC 230V/50Hz

Modulation : AM 80% , 1KHz sine wave , Dwell time: 3.0S				
Frequency Step Size : 1 % of preceding frequency value				
Frequency (MHz)	Antenna Polarization	face	Field strength (V/m)	Result
80~2700	Horizontal &Vertical	Front	10 V/m	A
80~2700	Horizontal &Vertical	Rear	10 V/m	A
80~2700	Horizontal &Vertical	Left	10 V/m	A
80~2700	Horizontal &Vertical	Right	10 V/m	A



Test Voltage: AC 195.5V/50Hz

Modulation : AM 80% , 1KHz sine wave , Dwell time: 3.0 S

Frequency Step Size : 1 % of preceding frequency value

Frequency (MHz)	Antenna Polarization	face	Field strength (V/m)	Result
80~2700	Horizontal & Vertical	Front	10 V/m	A
80~2700	Horizontal & Vertical	Rear	10 V/m	A
80~2700	Horizontal & Vertical	Left	10 V/m	A
80~2700	Horizontal & Vertical	Right	10 V/m	A

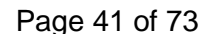
Test Voltage: AC 253V/50Hz

Modulation : AM 80% , 1KHz sine wave , Dwell time: 3.0 S

Frequency Step Size : 1 % of preceding frequency value

Frequency (MHz)	Antenna Polarization	face	Field strength (V/m)	Result
80~2700	Horizontal & Vertical	Front	10 V/m	A
80~2700	Horizontal & Vertical	Rear	10 V/m	A
80~2700	Horizontal & Vertical	Left	10 V/m	A
80~2700	Horizontal & Vertical	Right	10 V/m	A





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**Test Results:**

Test Mode 1

For EN 55024 : 2010+A1:2015

Test Voltage:230V/50Hz

Pulse : 5/50 ns		Repetition Rate: <u>5 kHz</u>			
Burst : 15m/300ms					
Test time : 1 min/each condition					
Voltage/ Mode/ Polarity/ Result/ Phase		<u>0.5 kV</u>		<u>1.0 kV</u>	
		+	-	+	-
Power Line	L	---	---	A	A
	N	---	---	A	A
	L-N	---	---	A	A
Signal Line	RJ45(10Mbps+POE)	A	A	---	---
	RJ45(100Mbps+POE)	A	A	---	---

For EN 50130-4:2011+A1:2014

Test Voltage: AC 230V/50Hz

Pulse : 5/50 ns		Repetition Rate: <u>5/100</u> kHz			
Burst : 15m/300ms					
Test time : 1 min/each condition					
Voltage/ Mode/ Polarity/ Result/ Phase		<u>1 kV</u>		<u>2.0 kV</u>	
		+	-	+	-
Power Line	L	---	---	A	A
	N	---	---	A	A
	L-N	---	---	A	A
Signal Line	RJ45(10Mbps+POE)	A	A	---	---
	RJ45(100Mbps+POE)	A	A	---	---



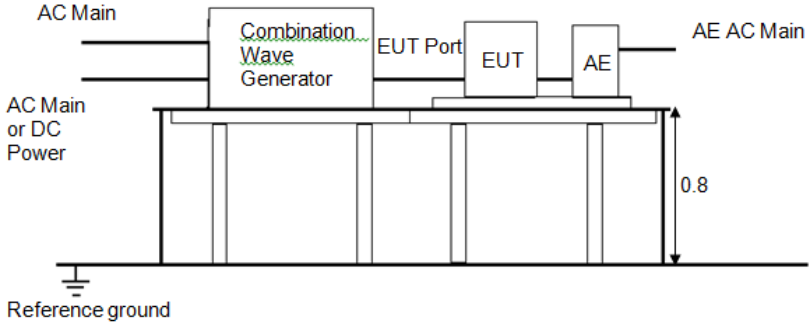
Test Voltage: AC 195.5V/50Hz

Pulse : 5/50 ns		Repetition Rate: <u>5/100</u> kHz			
Burst : 15m/300ms					
Test time : 1 min/each condition					
Voltage/ Mode/ Polarity/ Result/ Phase		<u>1</u> kV		<u>2.0</u> kV	
		+	-	+	-
Power Line	L	---	---	A	A
	N	---	---	A	A
	L-N	---	---	A	A
Signal Line	RJ45(10Mbps+POE)	A	A	---	---
	RJ45(100Mbps+POE)	A	A	---	---

Test Voltage: AC 253V/50Hz

Pulse : 5/50 ns		Repetition Rate: <u>5/100</u> kHz			
Burst : 15m/300ms					
Test time : 1 min/each condition					
Voltage/ Mode/ Polarity/ Result/ Phase		<u>1</u> kV		<u>2.0</u> kV	
		+	-	+	-
Power Line	L	---	---	A	A
	N	---	---	A	A
	L-N	---	---	A	A
Signal Line	RJ45(10Mbps+POE)	A	A	---	---
	RJ45(100Mbps+POE)	A	A	---	---

## 5.2.4 SURGE IMMUNITY

<b>Test Method:</b>	EN 61000-4-5	
<b>Test Level:</b>	FOR EN50130-4:2011/A1:2014 ± 0.5/1.0 kV Line to Line, ± 0.5/1.0 kV Signal port	For EN55024: ±1 kV Line-to-Line ± 0.5/1.0 kV Signal port
<b>Criterion Required:</b>	B	
<b>Polarity:</b>	Positive & Negative	
<b>Interval:</b>	60s between each surge	
<b>No. of Surges:</b>	5 positive, 5 negative at 0°, 90°, 180°, 270°.	
<b>Test Setup:</b>	 <p style="text-align: center;">For AC port</p>	
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1) The EUT was placed on a ground reference plane (GRP) insulated by an insulating support 0.1 m thick and the GRP was placed on a 0.8m high wooden table for table-top equipment. For floor standing equipment, the EUT was placed on a 0.1m high wooden support above the GRP.</li> <li>2) The 1.2/50 <math>\mu</math>s surge was to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks were required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines and to provide sufficient decoupling impedance to the surge wave so that the specified wave may be applied on the lines under test.</li> <li>3) The power cord between the EUT and the coupling/decoupling network was not exceed 2 m in length. The interconnection line between the EUT and the coupling/ decoupling network shall not exceed 2 m in length.</li> <li>4) The EUT was conducted 0.5 kV and 1 kV test voltage for line to line and line to neutral and conducted 0.5 kV, 1 kV and 2 kV test voltage for line to earth and neutral to earth, five positive pulses and five negative pulses each at 0°, 90°, 180° and 270° for a.c. power ports and five positive pulses and five negative surge pulses for d.c. power ports (for telecommunication port, It was 0.5 kV for indoor cable longer than 10m line to ground and 0.5kV,1kV test voltage for outdoor cable line to ground, five positive pulses and five negative surge pulses), The test levels were applied on the EUT with a 2 <math>\Omega</math> generator source impedance for power supply terminals and 40<math>\Omega</math> output impedance for interconnection lines. The tests were done at repetition rate one per minute.</li> </ol>	



### Test Results:

Test Mode 1

For EN 55024 : 2010+A1:2015

Test Voltage: AC 230V/50Hz

Test Voltage:230V/50Hz						
Waveform : 1.2/50µs(8/20µs)    Repetition rate : 60 sec    Time : 20 time/each condition						
/Phase Voltage / Mode / Polarity / Result			0°	90°	180°	270°
<u>0.5/1.0 kV</u>	L-N	+	A	A	A	A
		-	A	A	A	A

Waveform :10/700µs    Repetition rate : 60 sec    Time : 5 time/each condition				
Voltage		<u>0.5 kV</u>		<u>1.0 kV</u>
Mode / Polarity / Result		+	-	+
RJ45(10Mbps+POE)		A	A	A
RJ45(100Mbps+POE)		A	A	A



For EN 50130-4:2011+A1:2014

Test Voltage: AC 230V/50Hz						
Waveform : 1.2/50µs(8/20µs)    Repetition rate : 60 sec    Time : 20 time/each condition						
/Phase Voltage / Mode / Polarity / Result			0°	90°	180°	270°
<u>0.5/1.0</u> kV	L-N	+	A	A	A	A
		-	A	A	A	A

Waveform : 1.2/50µs(8/20µs)    Repetition rate : 60 sec    Time : 5 time/each condition				
Voltage	<u>0.5</u> kV		<u>1.0</u> kV	
Mode / Polarity / Result	+	-	+	-
RJ45(10Mbps+POE)	A	A	A	A
RJ45(100Mbps+POE)	A	A	A	A

Waveform : 10/700µs    Repetition rate : 60 sec    Time : 5 time/each condition				
Voltage	<u>0.5</u> kV		<u>1.0</u> kV	
Mode / Polarity / Result	+	-	+	-
RJ45(10Mbps+POE)	A	A	A	A
RJ45(100Mbps+POE)	A	A	A	A



Test Voltage: AC 195.5V/50Hz						
Waveform : 1.2/50µs(8/20µs)    Repetition rate : 60 sec    Time : 20 time/each condition						
/Phase Voltage / Mode / Polarity / Result			0°	90°	180°	270°
<u>0.5/1.0 kV</u>	L-N	+	A	A	A	A
		-	A	A	A	A

Waveform : 1.2/50µs(8/20µs)    Repetition rate : 60 sec    Time : 5 time/each condition				
Voltage	<u>0.5 kV</u>		<u>1.0 kV</u>	
Mode / Polarity / Result	+	-	+	-
RJ45(10Mbps+POE)	A	A	A	A
RJ45(100Mbps+POE)	A	A	A	A

Waveform : 10/700µs    Repetition rate : 60 sec    Time : 5 time/each condition				
Voltage	<u>0.5 kV</u>		<u>1.0 kV</u>	
Mode / Polarity / Result	+	-	+	-
RJ45(10Mbps+POE)	A	A	A	A
RJ45(100Mbps+POE)	A	A	A	A

Test Voltage: AC 253V/50Hz						
Waveform : 1.2/50µs(8/20µs)    Repetition rate : 60 sec    Time : 20 time/each condition						
/Phase Voltage / Mode / Polarity / Result			0°	90°	180°	270°
<u>0.5/1.0 kV</u>	L-N	+	A	A	A	A
		-	A	A	A	A

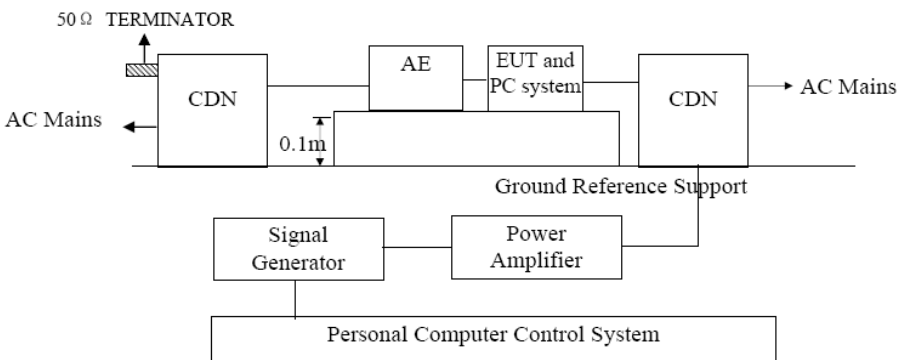




Waveform : 1.2/50 $\mu$ s(8/20 $\mu$ s)    Repetition rate : 60 sec    Time : 5 time/each condition				
Voltage	<u>0.5</u> kV		<u>1.0</u> kV	
Mode / Polarity / Result	+	-	+	-
RJ45(10Mbps+POE)	A	A	A	A
RJ45(100Mbps+POE)	A	A	A	A

Waveform : 10/700 $\mu$ s    Repetition rate : 60 sec    Time : 5 time/each condition				
Voltage	<u>0.5</u> kV		<u>1.0</u> kV	
Mode / Polarity / Result	+	-	+	-
RJ45(10Mbps+POE)	A	A	A	A
RJ45(100Mbps+POE)	A	A	A	A

## 5.2.5 CONDUCTED IMMUNITY

<b>Test Method:</b>	EN 61000-4-6
<b>Criterion Required:</b>	A
<b>Test Setup:</b>	 <p style="text-align: center;">For AC port</p>
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1) The EUT was placed on an insulating support of 0.1m height above a ground reference Plane, arranged and connected to satisfy its functional requirement. All cables exiting the EUT was supported at a height of at least 30 mm above the ground reference plane.</li> <li>2) The coupling and decoupling devices were required; they were located between 0.1m and 0.3m from the EUT. This distance was to be measured horizontally from the projection of the EUT on to the ground reference plane to the coupling and decoupling device.</li> <li>3) Each AE, used with clamp injection, shall be placed on an insulating support 0.1m above the ground reference plane. A decoupling network shall be installed on each cable between the EUT and AE except the cable under test. All cables connected to each AE, other than those being connected to the EUT, shall be provided with decoupling networks. The decoupling networks connected to each AE (except those on cables between the EUT and AE) shall be applied no further than 0.3m from the AE. The cable(s) between the AE and the decoupling network (s) or in between the AE and the injection clamp shall not be bundled nor wrapped and shall be kept between 30mm and 50mm above the ground reference plane.</li> <li>4) The frequency range was swept from 150 kHz to 80MHz, using the signal levels established during the setting process, and with the disturbance signal 80 % amplitude modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or to change coupling devices as necessary. Where the frequency was swept incrementally, the step size does not exceed 1% of the preceding frequency value. The dwell time of the amplitude modulated carrier at each frequency was not less than the time necessary for the EUT to be exercised and to respond, and was not less than 0.5 s.</li> </ol>

### Test Results:

Test Mode 1

For EN 55024 : 2010+A1:2015

Test Voltage: AC 230V/50Hz

Frequency : 0.15~80MHz, Modulation : AM 80%,1KHz sine wave, Dwell time: 3.0s Frequency Step Size : 1 % of preceding frequency value			
Frequency	Test mode	Voltage(V)	Result
0.15 ~ 80MHz	Power(M2)	3	A
0.15 ~ 80MHz	RJ45(10Mbps+POE)	3	A
0.15 ~ 80MHz	RJ45(100Mbps+POE)	3	A

For EN 50130-4:2011+A1:2014

Test Voltage: AC 230V/50Hz

Frequency : 0.15~100MHz, Modulation : AM 80%,1KHz sine wave, Dwell time: 3.0s Frequency Step Size : 1 % of preceding frequency value			
Frequency	Test mode	Voltage(V)	Result
0.15 ~ 100MHz	Power(M2)	10	A
0.15 ~ 100MHz	RJ45(10Mbps+POE)	10	A
0.15 ~ 100MHz	RJ45(100Mbps+POE)	10	A



Test Voltage: AC 195.5V/50Hz

Frequency : 0.15~100MHz, Modulation : AM 80%,1KHz sine wave, Dwell time: 3.0s  
Frequency Step Size : 1 % of preceding frequency value

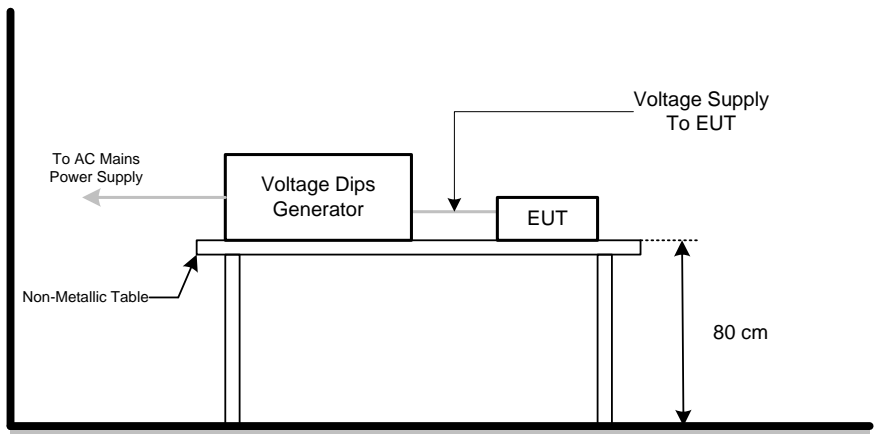
Frequency	Test mode	Voltage(V)	Result
0.15 ~ 100MHz	Power(M2)	10	A
0.15 ~ 100MHz	RJ45(10Mbps+POE)	10	A
0.15 ~ 100MHz	RJ45(100Mbps+POE)	10	A

Test Voltage: AC 253V/50Hz

Frequency : 0.15~100MHz, Modulation : AM 80%,1KHz sine wave, Dwell time: 3.0s  
Frequency Step Size : 1 % of preceding frequency value

Frequency	Test mode	Voltage(V)	Result
0.15 ~ 100MHz	Power(M2)	10	A
0.15 ~ 100MHz	RJ45(10Mbps+POE)	10	A
0.15 ~ 100MHz	RJ45(100Mbps+POE)	10	A

## 5.2.6 Voltage Dips and Interruptions

<b>Test Method:</b>	EN 61000-4-11
<b>Test Level:</b>	<p><b>For EN50130-4:</b> 80% for 250 Periods 70 % for 25 Periods 40 % for 10 Periods 0% for 250 Periods</p> <p><b>For EN55024:</b> &gt;95 % for 0.5 Periods 30 % for 25 Periods &gt;95 % for 250 Periods</p>
<b>No. of Dips / Interruptions:</b>	3 per Level
<b>Test Setup:</b>	
<b>Test Procedure:</b>	<ol style="list-style-type: none"> <li>1) The EUT was placed on a ground reference plane (GRP) insulated by an insulating support 0.1 m thick and the GRP was placed on a 0.8m high wooden table for table-top equipment. For floor standing equipment, the EUT was placed on a 0.1m high wooden support above the GRP.</li> <li>2) The test was performed with the EUT connected to the test generator with the shortest power supply cable as specified by the EUT manufacturer.</li> <li>3) The EUT was tested for each selected combination of test level and duration with a sequence of three dips /interruptions with intervals of 10 s minimum. Each representative mode of operation was tested.</li> <li>4) For EUT with more than one power cord, each power cord was tested individually.</li> </ol>

### Test Results:

Test Mode 1

For EN 55024 : 2010+A1:2015

Voltage(UT): AC 100V/50 Hz    Interval(s) : 10s    Times : 3										
Test mod	Test level UT %	Durations (period / ms )	Phase / Result							
			0	45	90	135	180	225	270	315
Voltage interruptions	>95%	250	C	C	C	C	C	C	C	C
Voltage dips	30%	25	B	B	B	B	B	B	B	B
	>95%	0.5	B	B	B	B	B	B	B	B

Voltage(UT): AC 230V/240 V/50 Hz    Interval(s) : 10s    Times : 3										
Test mod	Test level UT %	Durations (period / ms )	Phase / Result							
			0	45	90	135	180	225	270	315
Voltage interruptions	>95%	250	C	C	C	C	C	C	C	C
Voltage dips	30%	25	A	A	A	A	A	A	A	A
	>95%	0.5	A	A	A	A	A	A	A	A



For EN 50130-4:2011+A1:2014

Test Voltage: AC 230V/50Hz Interval(s) : 10s Times : 3										
Test mod	Test level UT %	Durations (period / ms )	Phase / Result							
			0	45	90	135	180	225	270	315
Voltage interruptions	100%	250	A	A	A	A	A	A	A	A
Voltage dips	20%	250	A	A	A	A	A	A	A	A
	30%	25	A	A	A	A	A	A	A	A
	60%	10	A	A	A	A	A	A	A	A

100% and 20% is permitted to UPS to meet the requirements of Result A.

Test Voltage: AC 195.5V/50Hz Interval(s) : 10s Times : 3										
Test mod	Test level UT %	Durations (period / ms )	Phase / Result							
			0	45	90	135	180	225	270	315
Voltage interruptions	100%	250	A	A	A	A	A	A	A	A
Voltage dips	20%	250	A	A	A	A	A	A	A	A
	30%	25	A	A	A	A	A	A	A	A
	60%	10	A	A	A	A	A	A	A	A

100% and 20% is permitted to UPS to meet the requirements of Result A.

Test Voltage: AC 253 V 50 Hz Interval(s) : 10s Times : 3										
Test mod	Test level UT %	Durations (period / ms )	Phase / Result							
			0	45	90	135	180	225	270	315
Voltage interruptions	100%	250	A	A	A	A	A	A	A	A
Voltage dips	20%	250	A	A	A	A	A	A	A	A
	30%	25	A	A	A	A	A	A	A	A
	60%	10	A	A	A	A	A	A	A	A

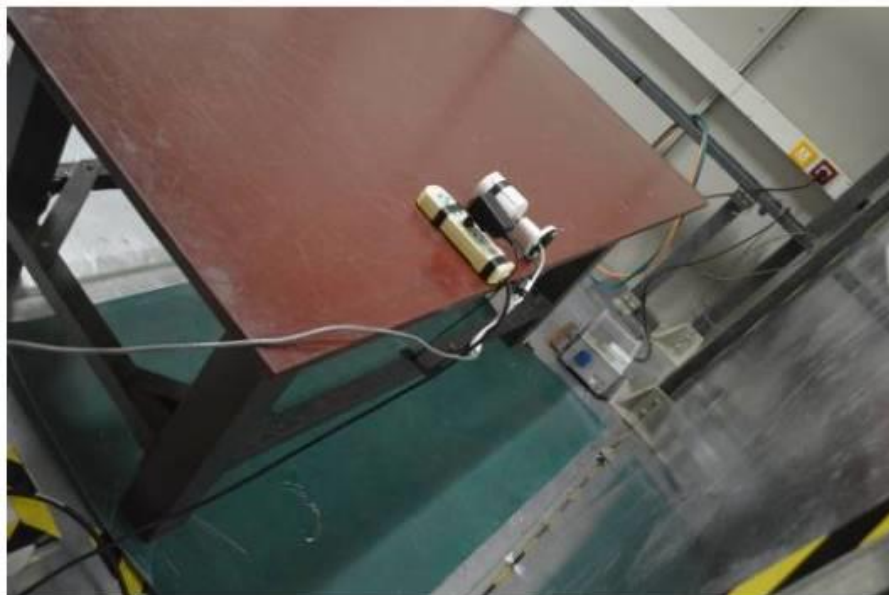
100% and 20% is permitted to UPS to meet the requirements of Result A.



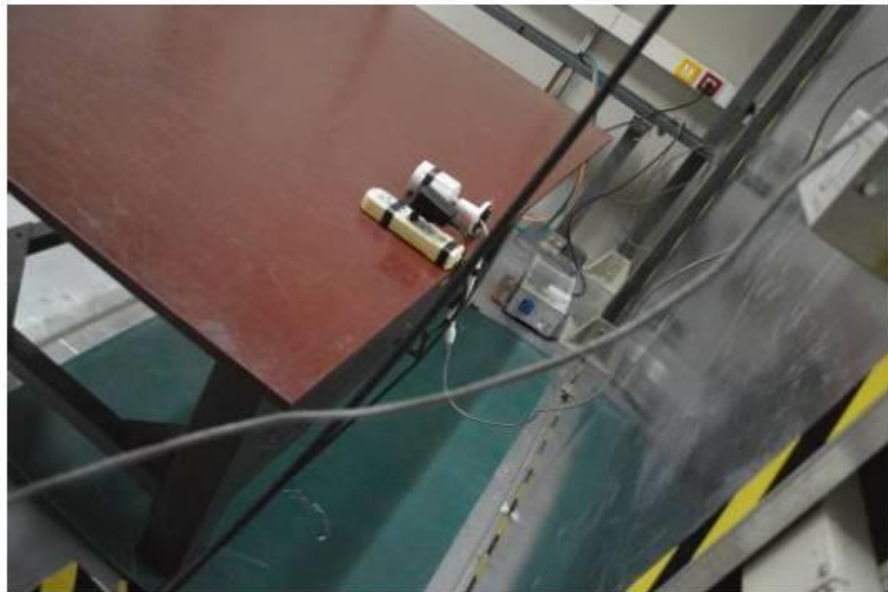
## 6 PHOTOGRAPHS OF EMC TEST CONFIGURATION

### 6.1 CONDUCTED EMISSION

Power Port  
Main

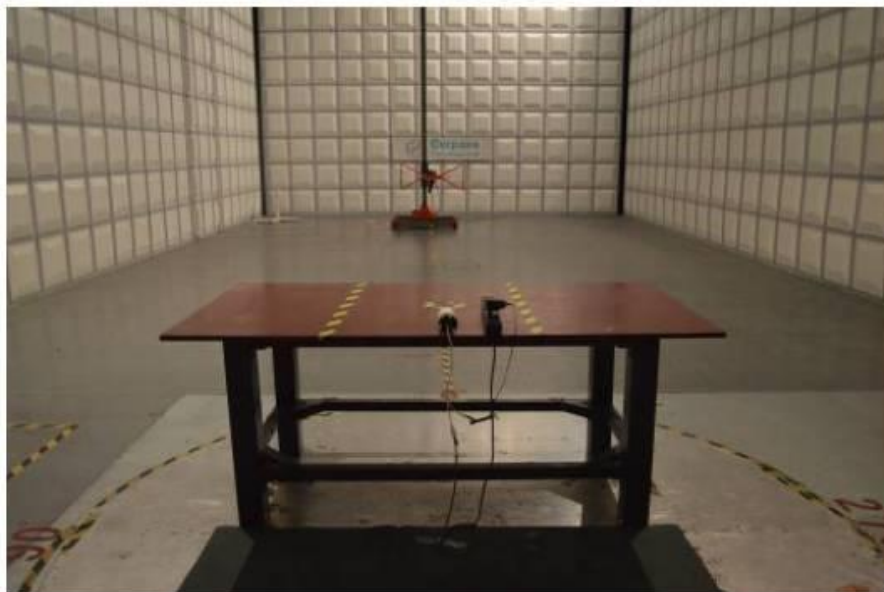


LAN

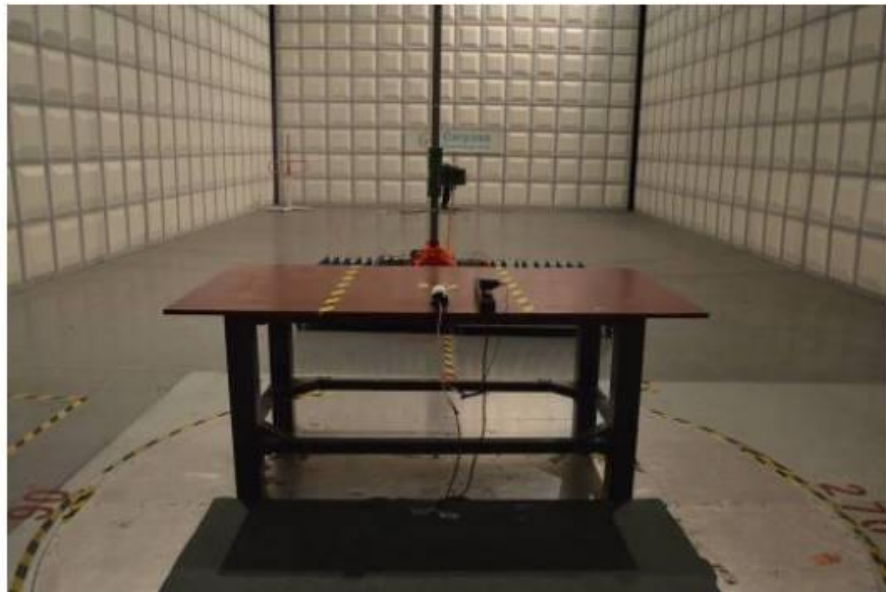


## 6.2 RADIATED EMISSION TEST SETUP

30MHz ~ 1000MHz



**Above 1000MHz**



## 6.3 VOLTAGE FLUCTUATION AND FLICK MEASUREMENT

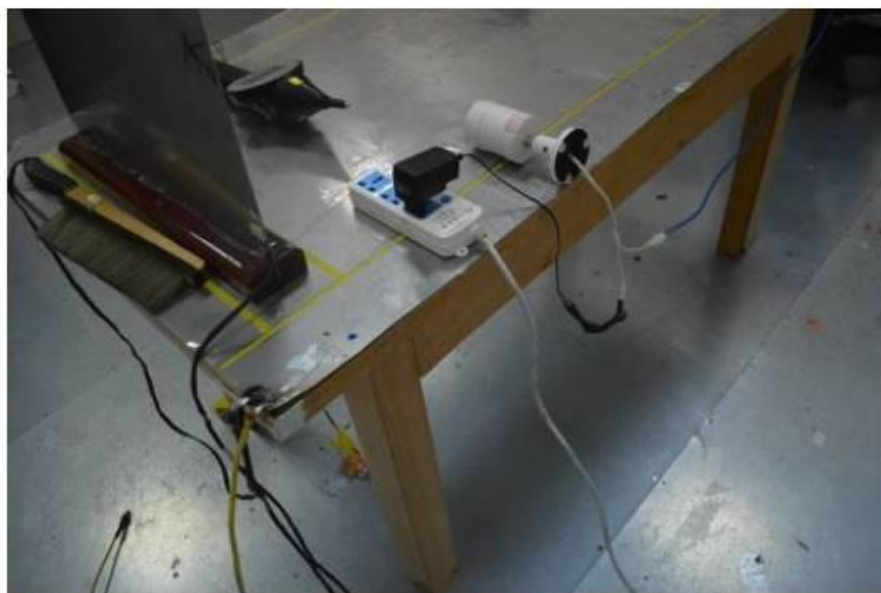
### Flicker



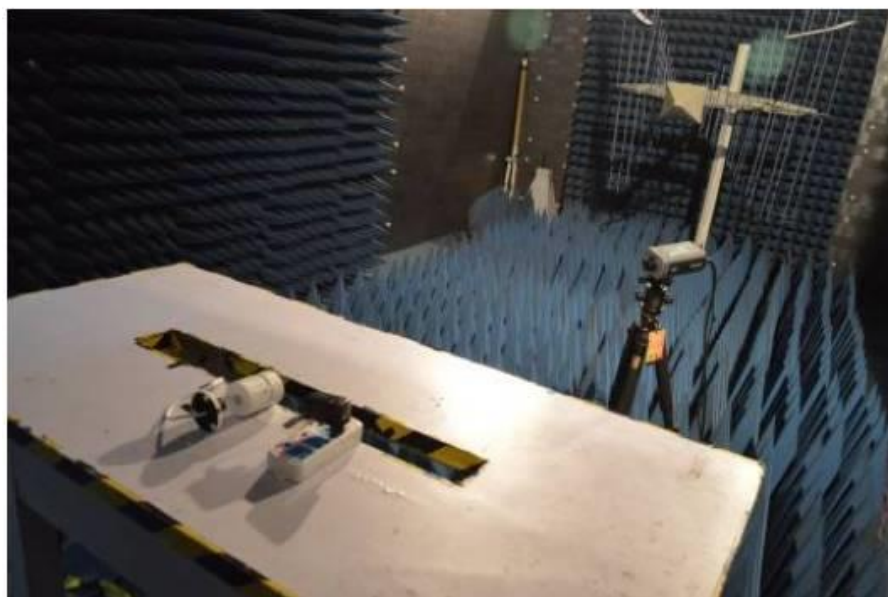




## 6.4 ESD



## 6.5 RADIO FREQUENCY ELECTROMAGNETIC FIELD IMMUNITY





## 6.6 ELECTRICAL FAST TRANSIENT/BURST / SURGE IMMUNITY / VOLTAGE DIPS AND SHORT INTERRUPTIONS IMMUNITY

Main



LAN



## 6.7 CONDUCTED IMMUNITY

LAN



## 7 Photographs of the EUT

1) EUT Photo (DH-IPC-HFW4431SP)



2) EUT Photo



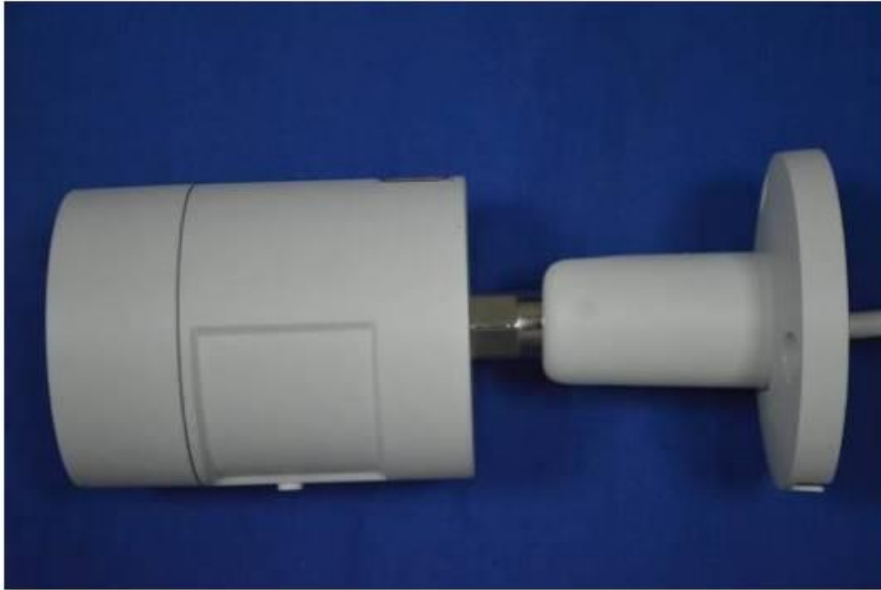
3) EUT Photo



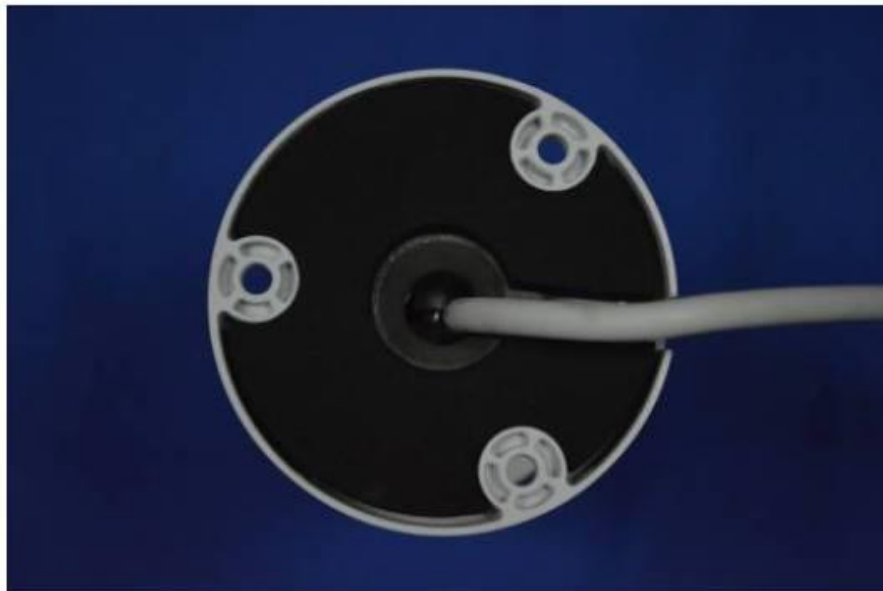
4) EUT Photo



5) EUT Photo



6) EUT Photo





7) EUT Photo



8) EUT Photo(DH-IPC-HFW4231SP)





9) EUT Photo



10) EUT Photo



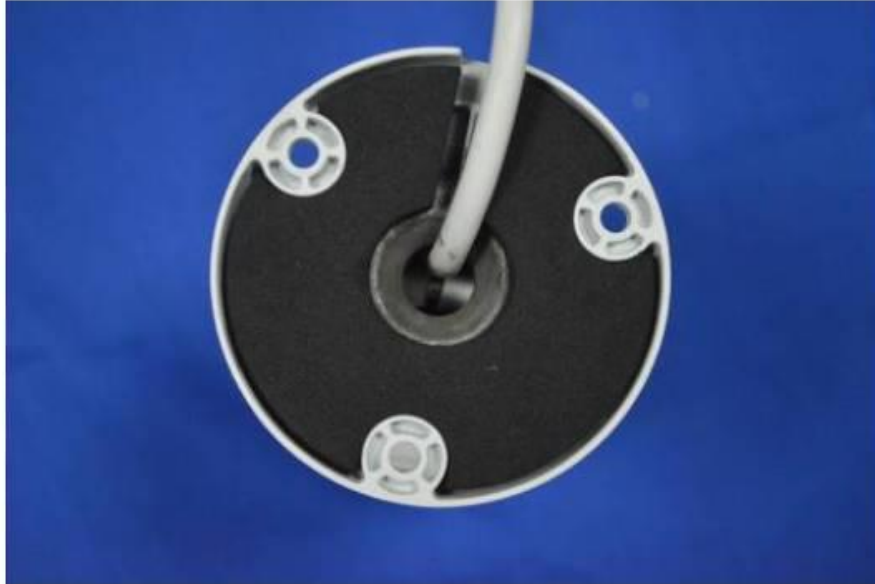
11) EUT Photo



12) EUT Photo



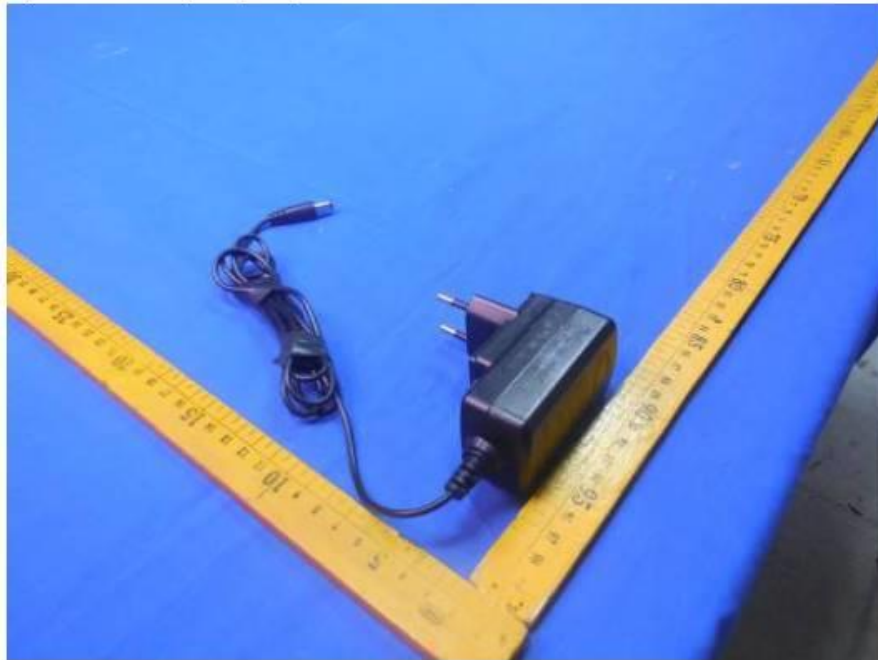
13) EUT Photo



14) EUT Photo



15) EUT Photo (Adapter)



16) EUT Photo



17) EUT Photo



18) EUT Photo



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**END OF REPORT**