



FCC Verification Test Report

According to
47 CFR, Part 2, Part 15, CISPR PUB. 22
ICES 003 Issue 6

Applicant : Zhejiang Dahua Vision Technology Co., Ltd.

Address : No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China

Equipment : IP CAMERA

Model No. : DH-IPC-HDBW4431FP-AS;DH-IPC-HDBW4431FN-AS;
IPC-HDBW4431FP-AS;IPC-HDBW4431FN-AS;
DH-IPC-HDBW4431FP-M12;DH-IPC-HDBW4431FN-M12;
IPC-HDBW4431FP-M12;IPC-HDBW4431FN-M12;
DH-IPC-HDBW4431FP-M;DH-IPC-HDBW4431FN-M;
IPC-HDBW4431FP-M;IPC-HDBW4431FN-M; N44BN52; N44BN52I;
N44BN53; N44BN53I; N44BN56; N44BN56I;
DH-IPC-HDBW4231FP-AS;DH-IPC-HDBW4231FN-AS;
IPC-HDBW4231FP-AS;IPC-HDBW4231FN-AS;
DH-IPC-HDBW4231FP-M12;DH-IPC-HDBW4231FN-M12;
IPC-HDBW4231FP-M12;IPC-HDBW4231FN-M12;
DH-IPC-HDBW4231FP-M;DH-IPC-HDBW4231FN-M;
IPC-HDBW4231FP-M;IPC-HDBW4231FN-M;N24BN52;N24BN52I;
N24BN53; N24BN53I; N24BN56; N24BN56I;
DH-IPC-HDB4231FP-MPC; DH-IPC-HDB4231FN-MPC;
DH-IPC-HDB4231FP-M12PC;DH-IPC-HDB4231FN-M12PC;
IPC-HDB4231FP-MPC; IPC-HDB4231FN-MPC;
IPC-HDB4231FP-M12PC; IPC-HDB4231FN-M12PC

I HEREBY CERTIFY THAT :

The sample was received on Aug 28, 2016 and the testing was carried out on Sep 11, 2016 at CerpPASS Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of CerpPASS Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Kero Kuo

EMC & RF Manager



FCC TEST REPORT

Issued by:

Cerpass Technology Co.,Ltd

No.10, Lane 2, Lianfu Street, Luzhu Township, Taoyuan County 33848, Taiwan(R.O.C.)

Tel: 886-3-322-6888

Fax: 886-3-322-6881

The test record, data evaluation & Equipment. Under Test configurations represented herein are true and accurate accounts of the measurements of the samples EMC characteristics under the conditions specified in this report.

Laboratory Accreditation:

☒ Cerpass Technology Corporation

| | |
|----------------------|-------------|
| TAF LAB Code: | 1439 |
|----------------------|-------------|



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History of this test report

☐ ORIGINAL.

■ Additional attachment as following record:

| Report No | Version | Date | Description |
|---------------|---------|--------------|------------------------------|
| SEFV1608018 | Rev 01 | Sep 14, 2016 | Initial Issue |
| SEFV1608018-B | Rev 02 | Dec 15, 2017 | Second Issue(Add model name) |
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1. Summary of Test Procedure and Test Result

1.1. Applicable Standards

The measurements shown in this test report were made in accordance with the procedures given in ANSI C63.4 – 2014 and the energy emitted by this equipment was passed Part 2, Part 15, CISPR PUB. 22.

The energy emitted by this equipment was passed both Radiated and Conducted Emissions Class A limits.

| Test Item | Normative References | Test Result | Remarks |
|--------------------|--|-------------|---|
| Conducted Emission | ANSI C63.4-2014 FCC Part 15 Subpart B ICES 003 Issue 6 | PASS | Meets Class A Limit Minimum passing margin(QP) is -25.45 dB at 0.3300MHz |
| Radiated Emission | ANSI C63.4-2014 FCC Part 15 Subpart B ICES 003 Issue 6 | PASS | Meets Class A Limit Minimum passing margin(QP) is -4.23 dB at 408.3000 MHz |



2. Test Configuration of Equipment under Test

2.1. Manufacturer

Zhejiang Dahua Vision Technology Co., Ltd.

No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China

2.2. Feature of Equipment under Test

Second Issue

| | | |
|-----------|--|--|
| IP CAMERA | Model No.: | DH-IPC-HDBW4431FP-AS;DH-IPC-HDBW4431FN-AS; IPC-HDBW4431FP-AS;IPC-HDBW4431FN-AS; DH-IPC-HDBW4431FP-M12;DH-IPC-HDBW4431FN-M12; IPC-HDBW4431FP-M12;IPC-HDBW4431FN-M12; DH-IPC-HDBW4431FP-M;DH-IPC-HDBW4431FN-M; IPC-HDBW4431FP-M;IPC-HDBW4431FN-M; N44BN52; N44BN52I; N44BN53; N44BN53I; N44BN56; N44BN56I; DH-IPC-HDBW4231FP-AS;DH-IPC-HDBW4231FN-AS; IPC-HDBW4231FP-AS;IPC-HDBW4231FN-AS; DH-IPC-HDBW4231FP-M12;DH-IPC-HDBW4231FN-M12; IPC-HDBW4231FP-M12;IPC-HDBW4231FN-M12; DH-IPC-HDBW4231FP-M;DH-IPC-HDBW4231FN-M; IPC-HDBW4231FP-M;IPC-HDBW4231FN-M , N24BN52 , N24BN52I; N24BN53; N24BN53I; N24BN56; N24BN56I; DH-IPC-HDB4231FP-MPC; DH-IPC-HDB4231FN-MPC; DH-IPC-HDB4231FP-M12PC;DH-IPC-HDB4231FN-M12PC; IPC-HDB4231FP-MPC; IPC-HDB4231FN-MPC; IPC-HDB4231FP-M12PC; IPC-HDB4231FN-M12PC |
| Remark | The add model has fewer infrared features than the original model. | |
| Adapter | Model No.: | ADS-12B-12 12012Gz |
| | Input: | 100-240V~,50/60Hz, Max.0.3A |
| | Output: | 12.0V,1.0A |



Initial Issue

| | | |
|-----------|--|---|
| IP CAMERA | Model No.: | DH-IPC-HDBW4431FP-AS;DH-IPC-HDBW4431FN-AS; IPC-HDBW4431FP-AS;IPC-HDBW4431FN-AS; DH-IPC-HDBW4431FP-M12;DH-IPC-HDBW4431FN-M12; IPC-HDBW4431FP-M12;IPC-HDBW4431FN-M12; DH-IPC-HDBW4431FP-M;DH-IPC-HDBW4431FN-M; IPC-HDBW4431FP-M;IPC-HDBW4431FN-M; N44BN52; N44BN52I; N44BN53; N44BN53I; N44BN56; N44BN56I; DH-IPC-HDBW4231FP-AS;DH-IPC-HDBW4231FN-AS; IPC-HDBW4231FP-AS;IPC-HDBW4231FN-AS; DH-IPC-HDBW4231FP-M12;DH-IPC-HDBW4231FN-M12; IPC-HDBW4231FP-M12;IPC-HDBW4231FN-M12; DH-IPC-HDBW4231FP-M;DH-IPC-HDBW4231FN-M; IPC-HDBW4231FP-M;IPC-HDBW4231FN-M , N24BN52 , N24BN52I; N24BN53; N24BN53I; N24BN56; N24BN56I |
| Remark | 1) DH-IPC-HDBW4431FN-AS and DH-IPC-HDBW4231FN-AS were selected as the test model and their data have been recorded in this report. 2) They are identical except the model name and SENSOR board | |
| Adapter | Model No.: | ADS-12B-12 12012Gz |
| | Input: | 100-240V~,50/60Hz, Max.0.3A |
| | Output: | 12.0V,1.0A |



2.3. Test Manner

Test Manner

- a During testing, the interface cables and equipment positions were varied according to ANSI C63.4-2014.
- b Turn on the power of all equipment.
- c The complete test system included Notebook PC, POE Midspan and EUT for EMI test.

The pre-test modes(CE)

Mode 1 Full system for DH-IPC-HDBW4431FN-AS with Adapter +POE

Mode 2 Full system for DH-IPC-HDBW4231FN-AS with Adapter +POE

Select the worst case of the pre-test modes as the final test mode(CE)

Mode 1 Full system for DH-IPC-HDBW4431FN-AS with Adapter +POE

The pre-test modes(RE)

Mode 1 Full system for DH-IPC-HDBW4431FN-AS with Adapter +POE

Mode 2 Full system for DH-IPC-HDBW4431FN-AS with POE

Mode 3 Full system for DH-IPC-HDBW4231FN-AS with Adapter +POE

Mode 4 Full system for DH-IPC-HDBW4231FN-AS with POE

Select the worst case of the pre-test modes as the final test mode(RE)

Mode 1 Full system for DH-IPC-HDBW4431FN-AS with Adapter +POE

Mode 2 Full system for DH-IPC-HDBW4431FN-AS with POE

2.4. Description of Test System

| No. | Device | Manufacturer | Model No. | Description |
|-----|-------------|--------------|------------|-------------------------------|
| 1 | Notebook PC | SONY | PCG-71811P | Non-Shielded,1.5m (R33021) |
| 2 | POE Midspan | N/A | PFT1200 | Non-Shielded,1.8m |

| No. | Cable | Quantity | Description |
|-----|-----------|----------|----------------------|
| A | DC Cable | 1 | Non-Shielded,1.5m |
| B | LAN Cable | 1 | Non-Shielded, >3.0 m |
| C | LAN Cable | 1 | Non-Shielded, >3.0 m |



2.5. General Information of Test

| | | |
|-------------------------------------|-----------|---|
| <input checked="" type="checkbox"/> | Test Site | CerpPASS Technology Corporation Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.) Tel:+886-3-3226-888 Fax:+886-3-3226-881 Address: No.68-1, Shihbachongsi, Shihding Township, New Taipei City 223, Taiwan, R.O.C. Tel: +886-2-2663-8582 |
| | FCC | TW1079, TW1061 |
| | IC | 4934E-1, 4934E-2 |
| | VCCI | T-2205 for Telecommunication Test C-4663 for Conducted emission test R-4399, R-4218 for Radiated emission test G-812, G-813 for radiated disturbance above 1GHz |
| <input type="checkbox"/> | Test Site | CerpPASS Technology (Suzhou) Co.,Ltd Address: No.66,Tangzhuang Road, Suzhou Industrial Park, Jiangsu 215006, China Tel: +86-512-6917-5888 Fax: +86-512-6917-5666 |
| | IC | 7290A-1, 7290A-2 |
| | VCCI | T-1945 for Telecommunication Test C-2919 for Conducted emission test R-2670 for Radiated emission test G-227 for radiated disturbance above 1GHz |
| Frequency Range Investigated: | | Conducted: from 150kHz to 30 MHz Radiation: from 30 MHz to 6000MHz |
| Test Distance : | | The test distance of radiated emission below 1GHz from antenna to EUT is 10 M. The test distance of radiated emission above 1GHz from antenna to EUT is 3 M. |



2.6. Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Test results and Measurement uncertainty without any relationship in the test report.

| Measurement | Frequency | Uncertainty |
|------------------------------|---------------|---------------|
| Conducted emissions(LINE) | 0.09MHz-30MHz | +/- 0.6888 dB |
| Conducted emissions(NEUTRAL) | 0.09MHz-30MHz | +/- 0.7002 dB |

| Measurement | Polarity | Frequency | Uncertainty |
|------------------------------------|----------|--------------------|---------------|
| Radiated emissions (below 1GHz) | H | 30MHz ~ 200MHz | +/- 4.0677dB |
| | | 200MHz ~1000MHz | +/- 3.9131dB |
| | V | 30MHz ~ 200MHz | +/- 4.0678dB |
| | | 200MHz ~1000MHz | +/- 3.9142dB |
| Radiated emissions (above 1GHz) | H | 1000MHz ~18000MHz | +/- 3.8904 dB |
| | | 18000MHz ~40000MHz | +/-3.9356dB |
| | V | 1000MHz ~18000MHz | +/- 3.8896dB |
| | | 18000MHz ~40000MHz | +/- 3.8766dB |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Consistent with industry standard (e.g. CISPR 22: 2008, clause 11, Measurement Uncertainty) determining compliance with the limits shall be base on the results of the compliance measurement. Consequently the measure emissions being less than the maximum allowed emission result in this be a compliant test or passing test.



3. Test of Conducted Emission

3.1. Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-2014 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 3.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

For a Class A digital device that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms LISN. Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

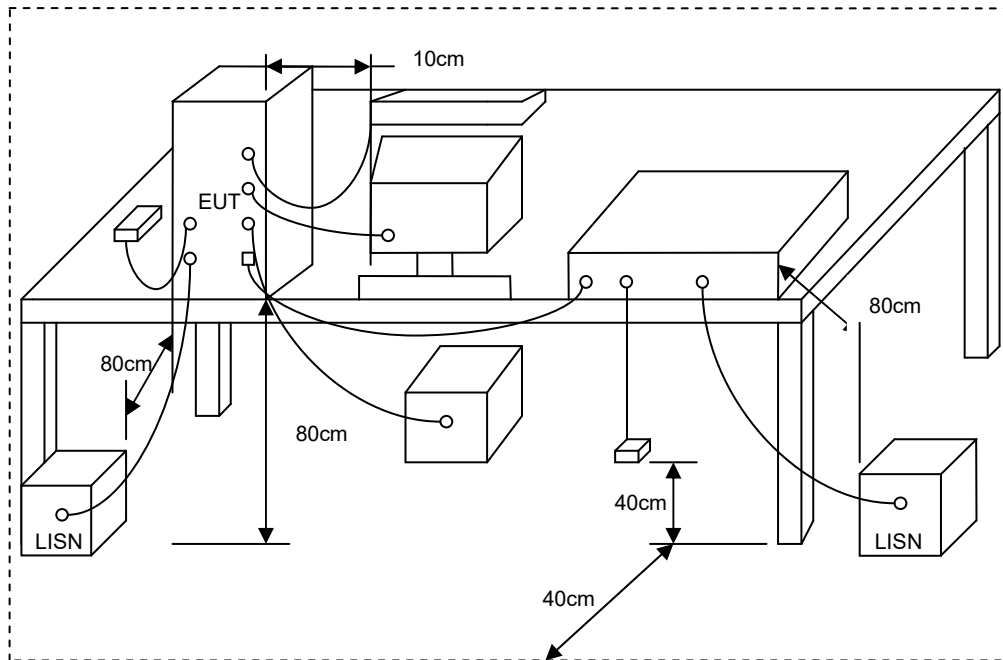
Table 1 Conducted Emission Limits (dB μ V):

| Frequency range (MHz) | Class A Equipment | | Class B Equipment | |
|--|-------------------|---------|-------------------|-----------|
| | Quasi Peak | Average | Quasi Peak | Average |
| 0.15 to 0.50 | 79 | 66 | 66 to 56* | 56 to 46* |
| 0.50 to 5 | 73 | 60 | 56 | 46 |
| 5. to 30. | 73 | 60 | 60 | 50 |
| *The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5MHz. | | | | |

3.2. Test Procedures

- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- Connect EUT to the power mains through a line impedance stabilization network (LISN).
- All the support units are connecting to the other LISN.
- The LISN provides 50 ohm coupling impedance for the measuring instrument.
- The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- Both sides of AC line were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

3.3. Typical test Setup



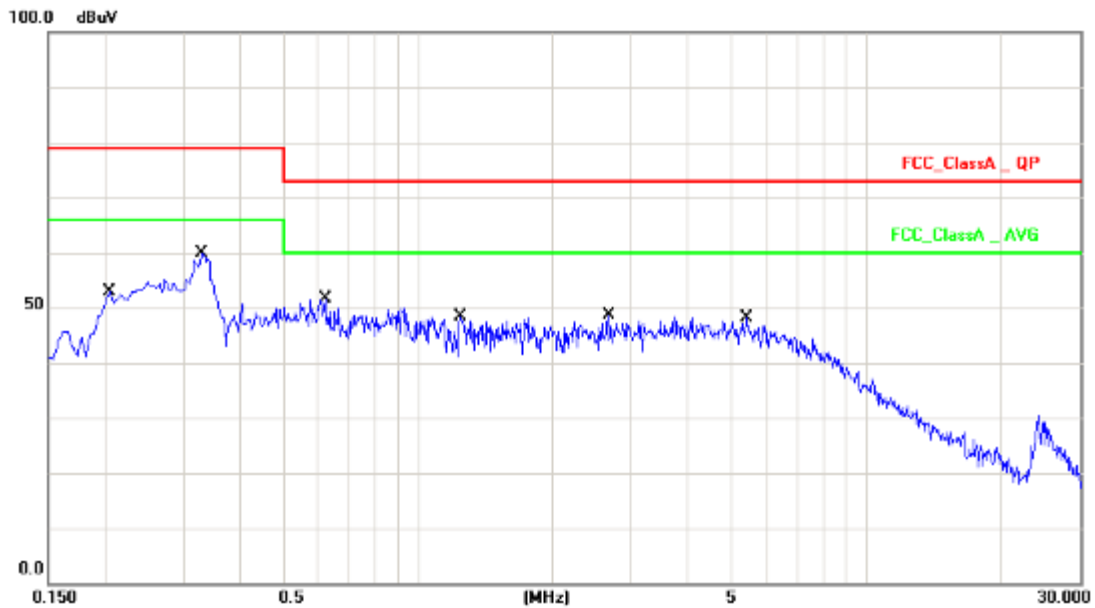
3.4. Measurement equipment

| Instrument/Ancillary | Manufacturer | Model No. | Serial No. | Calibration Date | Valid Date. |
|-----------------------------|--------------|-----------------|------------|------------------|-------------|
| Test Receiver | R&S | ESCI | 100565 | 2016.03.26 | 2017.03.25 |
| AMN | R&S | ESH2-Z5 | 100182 | 2016.08.31 | 2017.08.30 |
| Two-Line V-Network | R&S | ENV216 | 100325 | / | / |
| ISN | FCC | FCC-TLISN-T2-02 | 20379 | 2016.03.26 | 2017.03.25 |
| ISN | FCC | FCC-TLISN-T4-02 | 20380 | 2016.03.26 | 2017.03.25 |
| ISN | FCC | FCC-TLISN-T8-02 | 20381 | 2016.03.26 | 2017.03.25 |
| ISN | TESEQ | ISN ST08 | 30175 | 2016.03.26 | 2017.03.25 |
| Current Probe | R&S | EZ-17 | 100303 | 2016.03.26 | 2017.03.25 |
| Passive Voltage Probe | R&S | ESH2-Z3 | 100026 | 2016.03.26 | 2017.03.25 |
| Pulse Limiter | R&S | ESH3-Z2 | 100529 | 2016.03.26 | 2017.03.25 |
| Temperature/ Humidity Meter | Zhicheng | ZC1-11 | CEP-TH-004 | 2016.03.29 | 2017.03.28 |
| EZ-EMC | Fala | Ver CT3A1 | N/A | N/A | N/A |



3.5. Test Result and Data

| | | | | | | |
|------------------|--|------------|----------------------|--|--|--|
| Test Mode : | Mode 1: Full system for DH-IPC-HDBW4431FN-AS with Adapter +POE | | | | | |
| AC Power : | AC 120V/60Hz | Phase : | LINE | | | |
| Equipment : | IP CAMERA | Model No : | DH-IPC-HDBW4431FN-AS | | | |
| Temperature : | 25°C | Humidity : | 52% | | | |
| Pressure(mbar) : | 1002 | Date : | 2016/09/08 | | | |

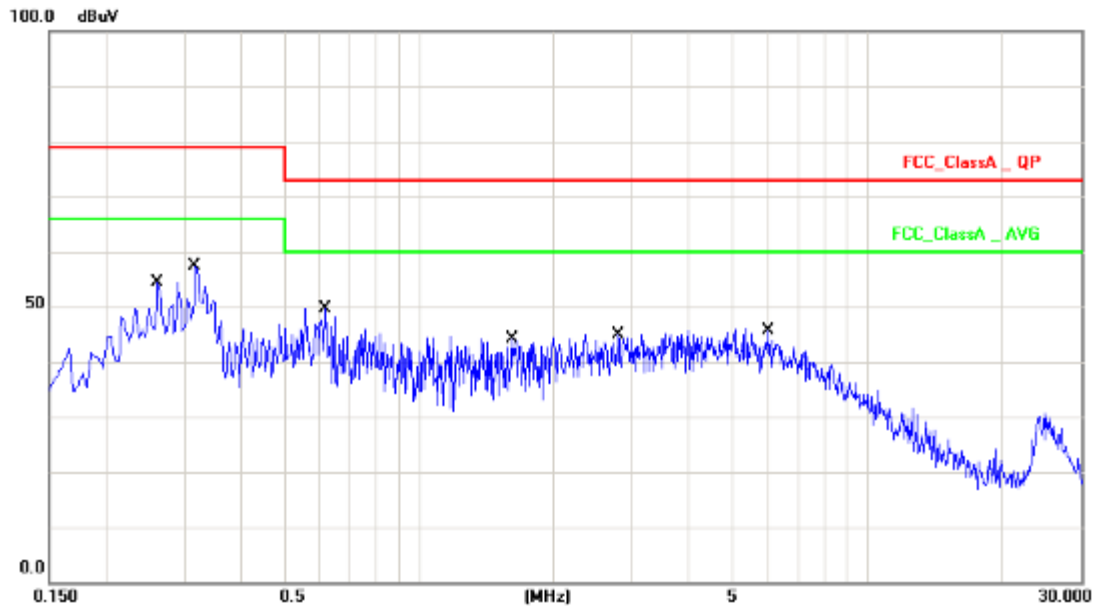


| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|
| 1 | 0.2060 | 10.13 | 35.18 | 45.31 | 79.00 | -33.69 | QP |
| 2 | 0.2060 | 10.13 | 12.55 | 22.68 | 66.00 | -43.32 | AVG |
| 3 | 0.3300 | 10.14 | 43.41 | 53.55 | 79.00 | -25.45 | QP |
| 4 | 0.3300 | 10.14 | 21.42 | 31.56 | 66.00 | -34.44 | AVG |
| 5 | 0.6220 | 10.16 | 34.72 | 44.88 | 73.00 | -28.12 | QP |
| 6 | 0.6220 | 10.16 | 12.65 | 22.81 | 60.00 | -37.19 | AVG |
| 7 | 1.2460 | 10.18 | 31.13 | 41.31 | 73.00 | -31.69 | QP |
| 8 | 1.2460 | 10.18 | 8.97 | 19.15 | 60.00 | -40.85 | AVG |
| 9 | 2.6740 | 10.19 | 30.42 | 40.61 | 73.00 | -32.39 | QP |
| 10 | 2.6740 | 10.19 | 8.80 | 18.99 | 60.00 | -41.01 | AVG |
| 11 | 5.4220 | 10.26 | 29.53 | 39.79 | 73.00 | -33.21 | QP |
| 12 | 5.4220 | 10.26 | 8.24 | 18.50 | 60.00 | -41.50 | AVG |

Note: Measurement Level = Reading Level + Correct Factor



| | | | |
|------------------|--|------------|----------------------|
| Test Mode : | Mode 1: Full system for DH-IPC-HDBW4431FN-AS with Adapter +POE | | |
| AC Power : | AC 120V/60Hz | Phase : | NEUTRAL |
| Equipment : | IP CAMERA | Model No : | DH-IPC-HDBW4431FN-AS |
| Temperature : | 25°C | Humidity : | 52% |
| Pressure(mbar) : | 1002 | Date : | 2016/09/08 |



| No. | Frequency (MHz) | Factor (dB) | Reading (dBuV) | Level (dBuV) | Limit (dBuV) | Margin (dB) | Detector |
|-----|-----------------|-------------|----------------|--------------|--------------|-------------|----------|
| 1 | 0.2620 | 10.13 | 33.67 | 43.80 | 79.00 | -35.20 | QP |
| 2 | 0.2620 | 10.13 | 12.64 | 22.77 | 66.00 | -43.23 | AVG |
| 3 | 0.3180 | 10.14 | 36.91 | 47.05 | 79.00 | -31.95 | QP |
| 4 | 0.3180 | 10.14 | 15.23 | 25.37 | 66.00 | -40.63 | AVG |
| 5 | 0.6180 | 10.16 | 28.49 | 38.65 | 73.00 | -34.35 | QP |
| 6 | 0.6180 | 10.16 | 7.93 | 18.09 | 60.00 | -41.91 | AVG |
| 7 | 1.6180 | 10.18 | 24.65 | 34.83 | 73.00 | -38.17 | QP |
| 8 | 1.6180 | 10.18 | 4.87 | 15.05 | 60.00 | -44.95 | AVG |
| 9 | 2.7940 | 10.20 | 25.10 | 35.30 | 73.00 | -37.70 | QP |
| 10 | 2.7940 | 10.20 | 4.46 | 14.66 | 60.00 | -45.34 | AVG |
| 11 | 6.0020 | 10.27 | 23.53 | 33.80 | 73.00 | -39.20 | QP |
| 12 | 6.0020 | 10.27 | 4.16 | 14.43 | 60.00 | -45.57 | AVG |

Note: Measurement Level = Reading Level + Correct Factor

Test engineer: Sun. Zhang



3.6. Test Photographs

Front View



Rear View





4. Test of Radiated Emission

4.1. Test Limit

Below 1GHz (for digital device)

For unintentional device, according to CISPR PUB.22, for Class B digital devices, the general requirement of field strength of radiated emissions from intentional radiators at a distance of 10 meters shall not exceed the below table.

| FREQUENCY (MHz) | dBuV/m (At 10m) | |
|-----------------|-----------------|---------|
| | Class A | Class B |
| 30 ~ 230 | 40 | 30 |
| 230 ~ 1000 | 47 | 37 |

Limit tables for non-digital device:

Class A Radiated Emission limit at 10m (for others)

| Frequency (MHZ) | Field Strength Limit (uV/m)Q.P. | Field Strength Limit (dBuV/m)Q.P. |
|-----------------|---------------------------------|-----------------------------------|
| 30 - 88 | 90 | 39 |
| 88 - 216 | 150 | 43.5 |
| 216 - 960 | 210 | 46.4 |
| Above 960 | 300 | 49.5 |

Class B Radiated Emission limit at 3m (for others)

| Frequency (MHZ) | Field Strength Limit (uV/m)Q.P. | Field Strength Limit (dBuV/m)Q.P. |
|-----------------|---------------------------------|-----------------------------------|
| 30 - 88 | 100 | 40 |
| 88 - 216 | 150 | 43.5 |
| 216 - 960 | 200 | 46 |
| Above 960 | 500 | 54 |

Above 1GHz(for all device)

| Frequency (MHZ) | Class A (dBuV/m) (At 10m) | | Class B (dBuV/m) (At 3m) | |
|-----------------|---------------------------|------|--------------------------|------|
| | Average | Peak | Average | Peak |
| Above 1000 | 49.5 | 69.5 | 54 | 74 |

NOTE: (1) The lower limit shall apply at the transition frequencies.
(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).
(3) The measurement above 1GHz is at close-in distances 3m, and determine the limit L2 corresponding to the close-in distance d2 by applying the following relation: $L2 = L1 (d1/d2)$, where L1 is the specified limit in microvolts per metre (uV/m) at the distance d1 (10m), L2 is the new limit for distance d2 (3m).
So the new Class A limit above 1GHz at 3m is as following table:



| Frequency (MHZ) | Class A (dBUV/m) (At 3m) | |
|--------------------|--------------------------|------|
| | Average | Peak |
| Above 1000 | 60 | 80 |

According to FCC Part 15.33 (b), for an unintentional radiator, including a digital device, 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 1.75 | 30 |
| 1.75-108 | 1000 |
| 108-500 | 2000 |
| 500-1000 | 5000 |
| Above 1000 | 5 th harmonic of the highest frequency or 40GHz, whichever is lower |

4.2. Test Procedures

Procedure of Preliminary Test

- The equipment was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane. When the EUT is a floor standing equipment, it is placed on the ground plane which has a 15 cm non-conductive covering to insulate the EUT from the ground plane.
- Support equipment, if needed, was placed as per ANSI C63.4.
- All I/O cables were positioned to simulate typical usage as per ANSI C63.4.
- The EUT received AC 120VAC/60Hz power source from the outlet socket under the turntable. All support equipment power received from another socket under the turntable.
- The antenna was placed at 3 or 10 meter away from the EUT as stated in ANSI C63.4. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.
- The Analyzer / Receiver quickly scanned from 30MHz to 40GHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning



the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.

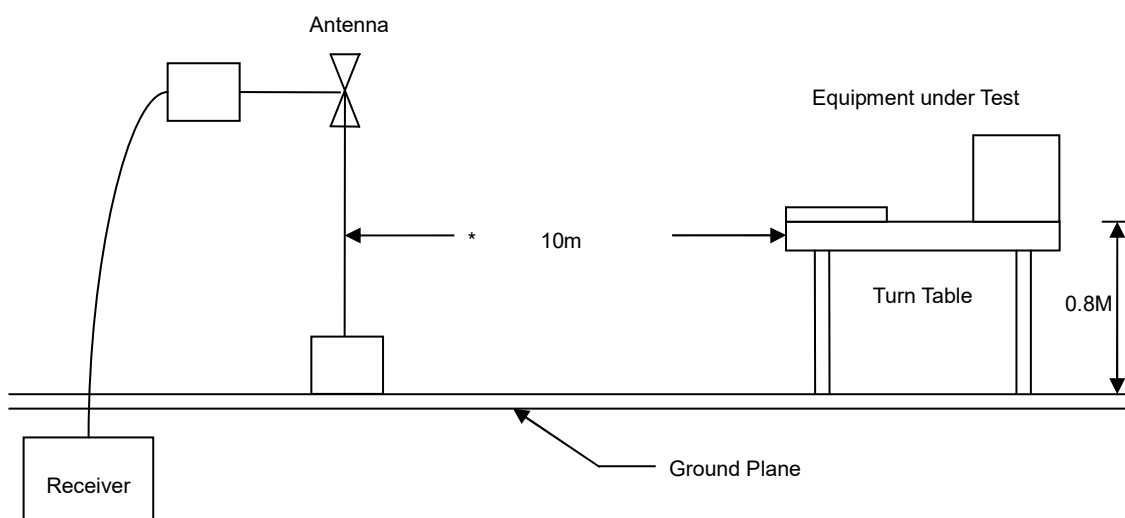
- Set the spectrum analyzer/ Receiver in the following setting as:
Below 1GHz:
RBW=120KHz / VBW=300KHz / Sweep=AUTO
Above 1GHz:
Peak: RBW=1MHz, VBW=3MHz / Sweep=AUTO
Average: RBW=1MHz / VBW=10Hz / Sweep=AUTO
- The worst configuration of EUT and cable of the above highest emission level were recorded for reference of the final test.

Procedure of Final Test

- EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.
- The Analyzer / Receiver scanned from 30MHz to 40GHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 or 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- Recording at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. Below 1GHz the Q.P. reading and above 1GHz the Peak and Average reading are presented.
- The test data of the worst-case condition(s) was recorded.

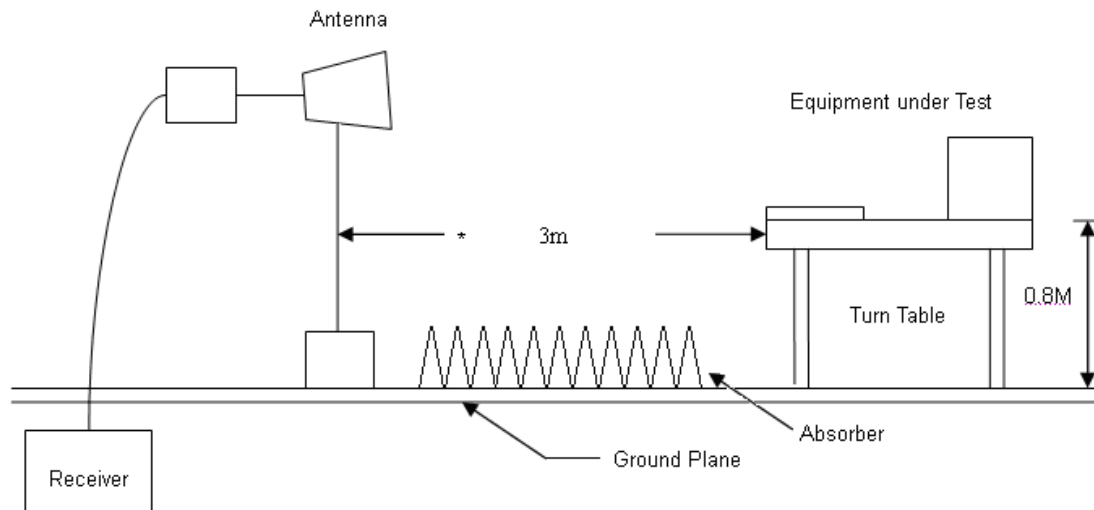
4.3. Typical test Setup

Below 1GHz Test Setup





Above 1GHz Test Setup



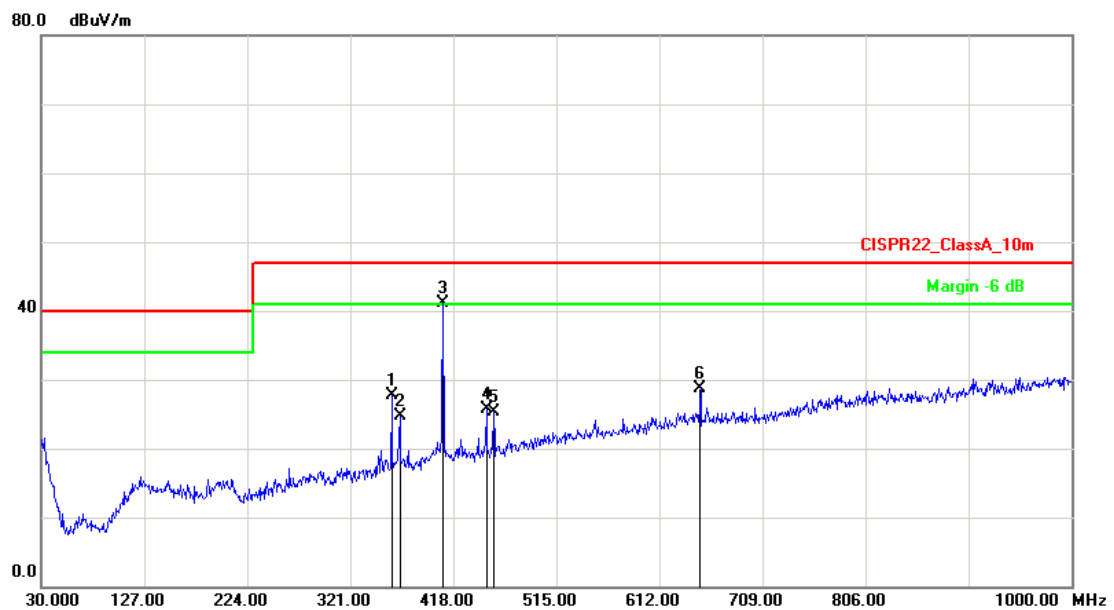
4.4. Measurement equipment

| Instrument/Ancillary | Manufacturer | Model No. | Serial No. | Calibration Date | Valid Date. |
|-----------------------------|---------------|-----------|------------|------------------|-------------|
| EMI Test Receiver | R&S | ESC17 | 100968 | 2016.03.26 | 2017.03.25 |
| Preamplifier | Agilent | 87405B | My39500554 | 2016.03.26 | 2017.03.25 |
| Preamplifier | Agilent | 8449B | 3008A02342 | 2016.03.26 | 2017.03.25 |
| Bilog Antenna | Sunol Science | JB1 | A072414-1 | 2016.04.16 | 2017.04.15 |
| Broad-Band Horn Antenna | Schwarzbeck | BBHA9120D | 9120D-618 | 2016.04.16 | 2017.04.15 |
| Spectrum Analyzer | R&S | FSP40 | 100324 | 2016.03.26 | 2017.03.25 |
| Temperature/ Humidity Meter | Zhicheng | ZC1-11 | CEP-TH-001 | 2016.03.29 | 2017.03.28 |
| EZ-EMC | Fala | Ver CT3A1 | N/A | N/A | N/A |



4.5. Test Result and Data (30MHz ~ 1000MHz)

| | | | |
|------------------|--|--------------------|----------------------|
| Test Mode : | Mode 1: Full system for DH-IPC-HDBW4431FN-AS with Adapter +POE | | |
| AC Power : | AC 120V/60Hz | Ant. Polarization: | Horizontal |
| Equipment : | IP CAMERA | Model No : | DH-IPC-HDBW4431FN-AS |
| Temp : | 25°C | Humidity : | 53% |
| Pressure(mbar) : | 1002 | Date : | 2016/08/28 |

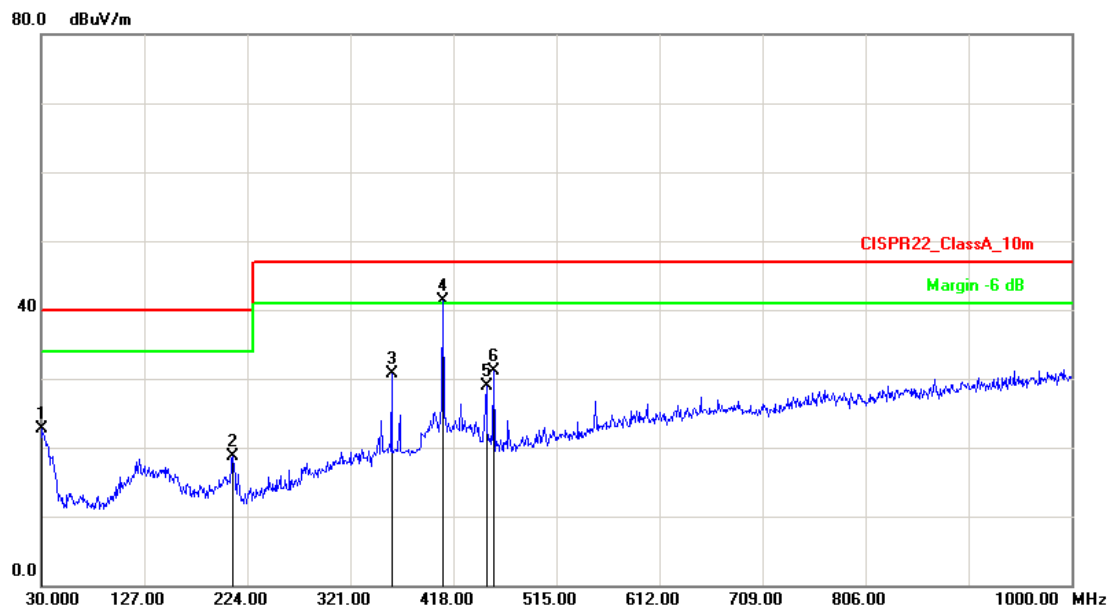


| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|------|-------------|---------------|
| 1 | 359.8000 | -6.84 | 34.63 | 27.79 | 47.00 | -19.21 | QP | 100 | 77 |
| 2 | 367.5600 | -6.65 | 31.39 | 24.74 | 47.00 | -22.26 | QP | 400 | 75 |
| 3 | 408.3000 | -5.26 | 46.41 | 41.15 | 47.00 | -5.85 | QP | 100 | 68 |
| 4 | 449.0400 | -4.58 | 30.26 | 25.68 | 47.00 | -21.32 | QP | 100 | 0 |
| 5 | 455.8299 | -4.42 | 29.67 | 25.25 | 47.00 | -21.75 | QP | 100 | 2 |
| 6 | 650.7999 | -0.30 | 29.08 | 28.78 | 47.00 | -18.22 | QP | 400 | 48 |

Note: Measurement Level = Reading Level + Correct Factor



| | | | |
|------------------|--|--------------------|----------------------|
| Test Mode : | Mode 1: Full system for DH-IPC-HDBW4431FN-AS with Adapter +POE | | |
| AC Power : | AC 120V/60Hz | Ant. Polarization: | Vertical |
| Equipment : | IP CAMERA | Model No : | DH-IPC-HDBW4431FN-AS |
| Temp : | 25℃ | Humidity : | 53% |
| Pressure(mbar) : | 1002 | Date : | 2016/08/28 |

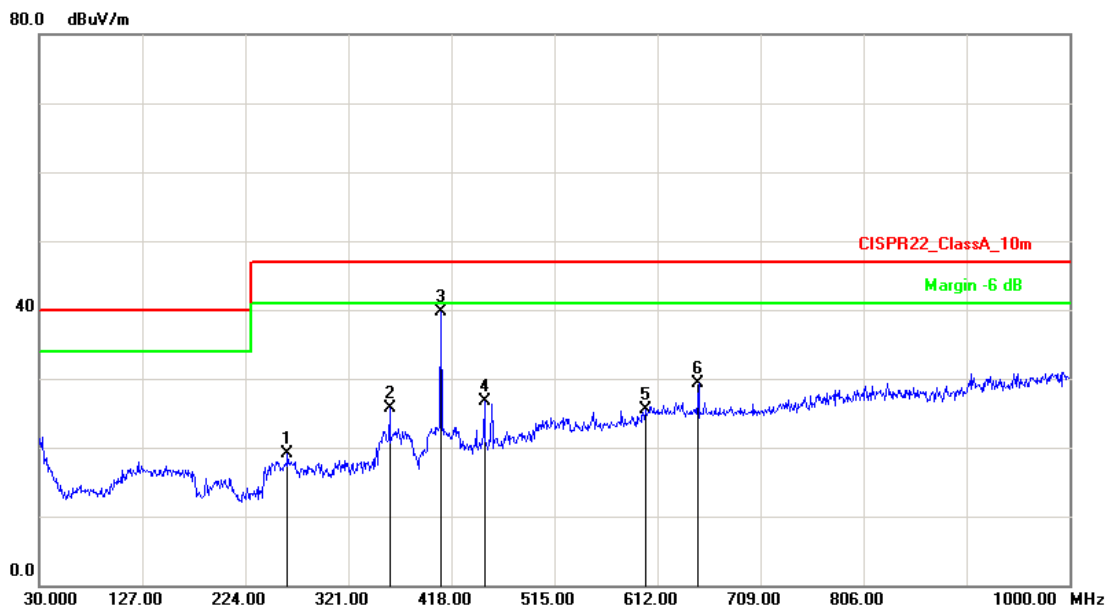


| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|------|-------------|---------------|
| 1 | 30.0000 | -3.26 | 26.00 | 22.74 | 40.00 | -17.26 | QP | 400 | 32 |
| 2 | 210.4199 | -10.97 | 29.65 | 18.68 | 40.00 | -21.32 | QP | 400 | 0 |
| 3 | 359.8000 | -6.84 | 37.51 | 30.67 | 47.00 | -16.33 | QP | 400 | 0 |
| 4 | 408.3000 | -5.26 | 46.53 | 41.27 | 47.00 | -5.73 | QP | 400 | 215 |
| 5 | 449.0400 | -4.58 | 33.43 | 28.85 | 47.00 | -18.15 | QP | 100 | 25 |
| 6 | 455.8299 | -4.42 | 35.56 | 31.14 | 47.00 | -15.86 | QP | 100 | 236 |

Note: Measurement Level = Reading Level + Correct Factor



| | | | |
|------------------|---|--------------------|----------------------|
| Test Mode : | Mode 2: Full system for DH-IPC-HDBW4431FN-AS with POE | | |
| DC Power : | POE 48V | Ant. Polarization: | Horizontal |
| Equipment : | IP CAMERA | Model No : | DH-IPC-HDBW4431FN-AS |
| Temp : | 25℃ | Humidity : | 53% |
| Pressure(mbar) : | 1002 | Date : | 2016/08/28 |

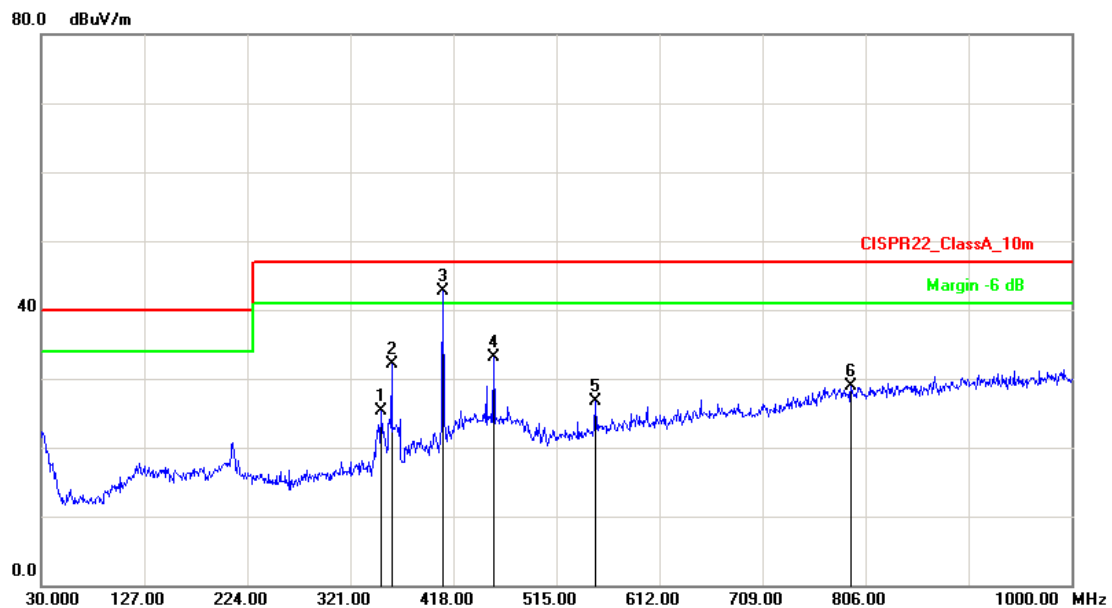


| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|------|-------------|---------------|
| 1 | 263.7699 | -9.81 | 28.92 | 19.11 | 47.00 | -27.89 | QP | 100 | 215 |
| 2 | 359.8000 | -6.84 | 32.63 | 25.79 | 47.00 | -21.21 | QP | 100 | 0 |
| 3 | 408.3000 | -5.26 | 44.91 | 39.65 | 47.00 | -7.35 | QP | 400 | 263 |
| 4 | 449.0400 | -4.58 | 31.26 | 26.68 | 47.00 | -20.32 | QP | 100 | 215 |
| 5 | 600.3600 | -1.24 | 26.65 | 25.41 | 47.00 | -21.59 | QP | 400 | 326 |
| 6 | 650.7998 | -0.30 | 29.58 | 29.28 | 47.00 | -17.72 | QP | 100 | 21 |

Note: Measurement Level = Reading Level + Correct Factor



| | | | |
|------------------|---|--------------------|----------------------|
| Test Mode : | Mode 2: Full system for DH-IPC-HDBW4431FN-AS with POE | | |
| DC Power : | POE 48V | Ant. Polarization: | Vertical |
| Equipment : | IP CAMERA | Model No : | DH-IPC-HDBW4431FN-AS |
| Temp : | 25°C | Humidity : | 53% |
| Pressure(mbar) : | 1002 | Date : | 2016/08/28 |

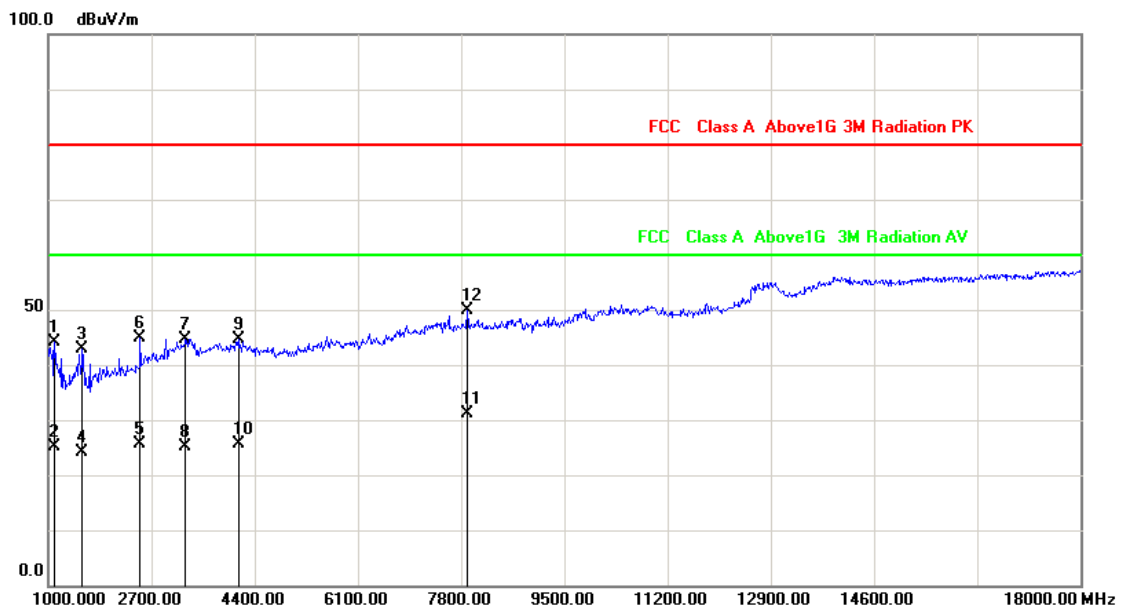


| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|------|-------------|---------------|
| 1 | 350.1000 | -7.31 | 32.63 | 25.32 | 47.00 | -21.68 | QP | 400 | 47 |
| 2 | 359.8000 | -6.84 | 39.01 | 32.17 | 47.00 | -14.83 | QP | 100 | 0 |
| 3 | 408.3000 | -5.26 | 48.03 | 42.77 | 47.00 | -4.23 | QP | 100 | 226 |
| 4 | 455.8299 | -4.42 | 37.56 | 33.14 | 47.00 | -13.86 | QP | 400 | 312 |
| 5 | 551.8600 | -2.01 | 28.68 | 26.67 | 47.00 | -20.33 | QP | 100 | 281 |
| 6 | 792.4198 | 1.96 | 26.96 | 28.92 | 47.00 | -18.08 | QP | 100 | 54 |

Note: Measurement Level = Reading Level + Correct Factor

**4.6. Test Result and Data (1000MHz ~ 18000MHz)**

| | | | |
|------------------|--|--------------------|----------------------|
| Test Mode : | Mode 1: Full system for DH-IPC-HDBW4431FN-AS with Adapter +POE | | |
| AC Power : | AC 120V/60Hz | Ant. Polarization: | Horizontal |
| Equipment : | IP CAMERA | Model No : | DH-IPC-HDBW4431FN-AS |
| Temp : | 25°C | Humidity : | 53% |
| Pressure(mbar) : | 1002 | Date : | 2016/08/28 |

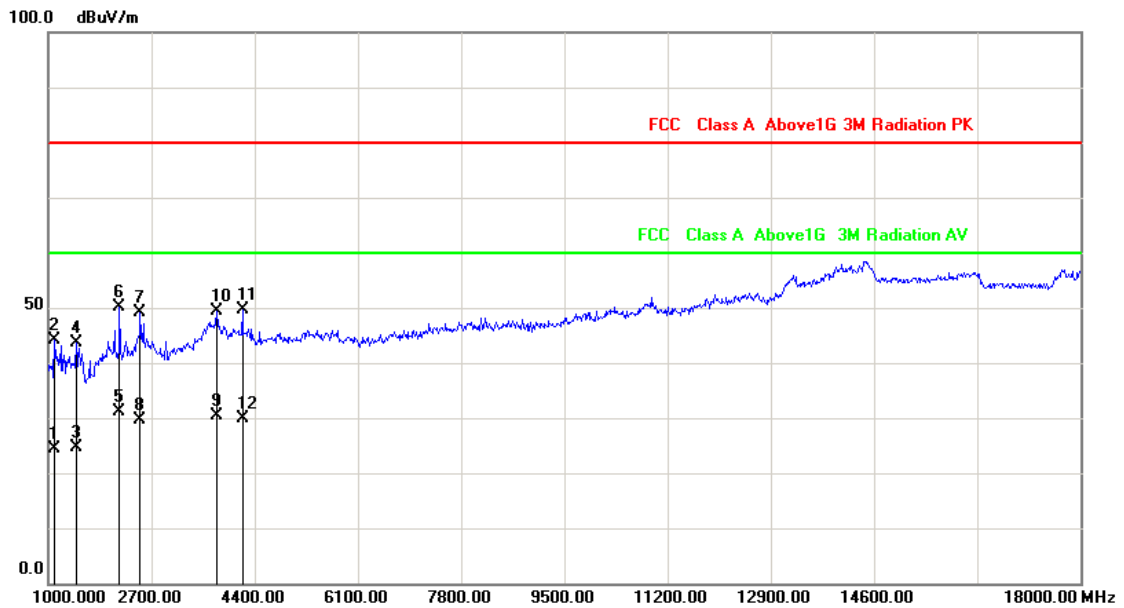


| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|------|-------------|---------------|
| 1 | 1102.000 | -16.89 | 61.05 | 44.16 | 80.00 | -35.84 | peak | 200 | 38 |
| 2 | 1103.000 | -16.89 | 41.98 | 25.09 | 60.00 | -34.91 | AVG | 200 | 38 |
| 3 | 1561.000 | -14.67 | 57.51 | 42.84 | 80.00 | -37.16 | peak | 100 | 164 |
| 4 | 1562.000 | -14.67 | 38.74 | 24.07 | 60.00 | -35.93 | AVG | 100 | 164 |
| 5 | 2511.000 | -9.92 | 35.62 | 25.70 | 60.00 | -34.30 | AVG | 200 | 266 |
| 6 | 2513.000 | -9.91 | 54.72 | 44.81 | 80.00 | -35.19 | peak | 200 | 266 |
| 7 | 3261.000 | -7.39 | 51.99 | 44.60 | 80.00 | -35.40 | peak | 100 | 119 |
| 8 | 3262.000 | -7.39 | 32.58 | 25.19 | 60.00 | -34.81 | AVG | 100 | 119 |
| 9 | 4128.000 | -4.19 | 48.70 | 44.51 | 80.00 | -35.49 | peak | 200 | 35 |
| 10 | 4129.000 | -4.19 | 29.71 | 25.52 | 60.00 | -34.48 | AVG | 200 | 35 |
| 11 | 7900.000 | 1.78 | 29.46 | 31.24 | 60.00 | -28.76 | AVG | 200 | 20 |
| 12 | 7902.000 | 1.79 | 47.97 | 49.76 | 80.00 | -30.24 | peak | 200 | 20 |

Note: Measurement Level = Reading Level + Correct Factor



| | | | |
|------------------|--|--------------------|----------------------|
| Test Mode : | Mode 1: Full system for DH-IPC-HDBW4431FN-AS with Adapter +POE | | |
| AC Power : | AC 120V/60Hz | Ant. Polarization: | Vertical |
| Equipment : | IP CAMERA | Model No : | DH-IPC-HDBW4431FN-AS |
| Temp : | 25°C | Humidity : | 53% |
| Pressure(mbar) : | 1002 | Date : | 2016/08/28 |

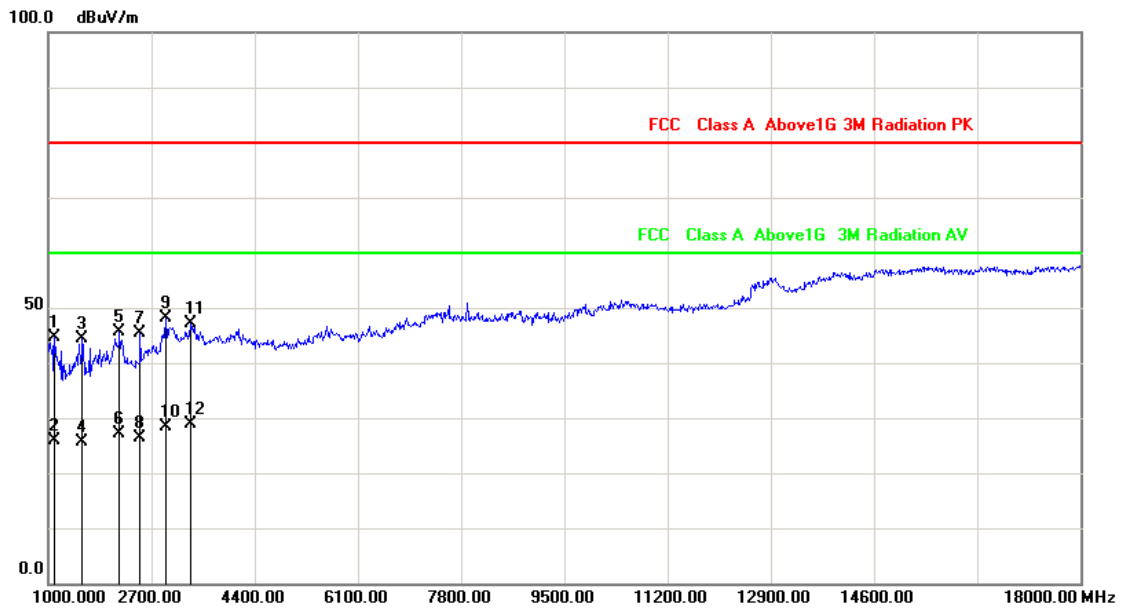


| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|------|-------------|---------------|
| 1 | 1101.000 | -16.90 | 41.36 | 24.46 | 60.00 | -35.54 | AVG | 200 | 142 |
| 2 | 1102.000 | -16.89 | 60.99 | 44.10 | 80.00 | -35.90 | peak | 200 | 142 |
| 3 | 1458.000 | -15.22 | 39.87 | 24.65 | 60.00 | -35.35 | AVG | 100 | 336 |
| 4 | 1459.000 | -15.21 | 58.76 | 43.55 | 80.00 | -36.45 | peak | 100 | 336 |
| 5 | 2172.000 | -11.41 | 42.50 | 31.09 | 60.00 | -28.91 | AVG | 200 | 219 |
| 6 | 2173.000 | -11.40 | 61.48 | 50.08 | 80.00 | -29.92 | peak | 200 | 219 |
| 7 | 2513.000 | -9.91 | 58.96 | 49.05 | 80.00 | -30.95 | peak | 100 | 8 |
| 8 | 2516.000 | -9.90 | 39.51 | 29.61 | 60.00 | -30.39 | AVG | 100 | 8 |
| 9 | 3770.000 | -5.22 | 35.62 | 30.40 | 60.00 | -29.60 | AVG | 200 | 39 |
| 10 | 3771.000 | -5.21 | 54.50 | 49.29 | 80.00 | -30.71 | peak | 200 | 39 |
| 11 | 4196.000 | -4.17 | 53.84 | 49.67 | 80.00 | -30.33 | peak | 100 | 118 |
| 12 | 4197.000 | -4.17 | 34.15 | 29.98 | 60.00 | -30.02 | AVG | 100 | 118 |

Note: Measurement Level = Reading Level + Correct Factor



| | | | |
|------------------|---|--------------------|----------------------|
| Test Mode : | Mode 2: Full system for DH-IPC-HDBW4431FN-AS with POE | | |
| DC Power : | POE 48V | Ant. Polarization: | Horizontal |
| Equipment : | IP CAMERA | Model No : | DH-IPC-HDBW4431FN-AS |
| Temp : | 25°C | Humidity : | 53% |
| Pressure(mbar) : | 1002 | Date : | 2016/08/28 |

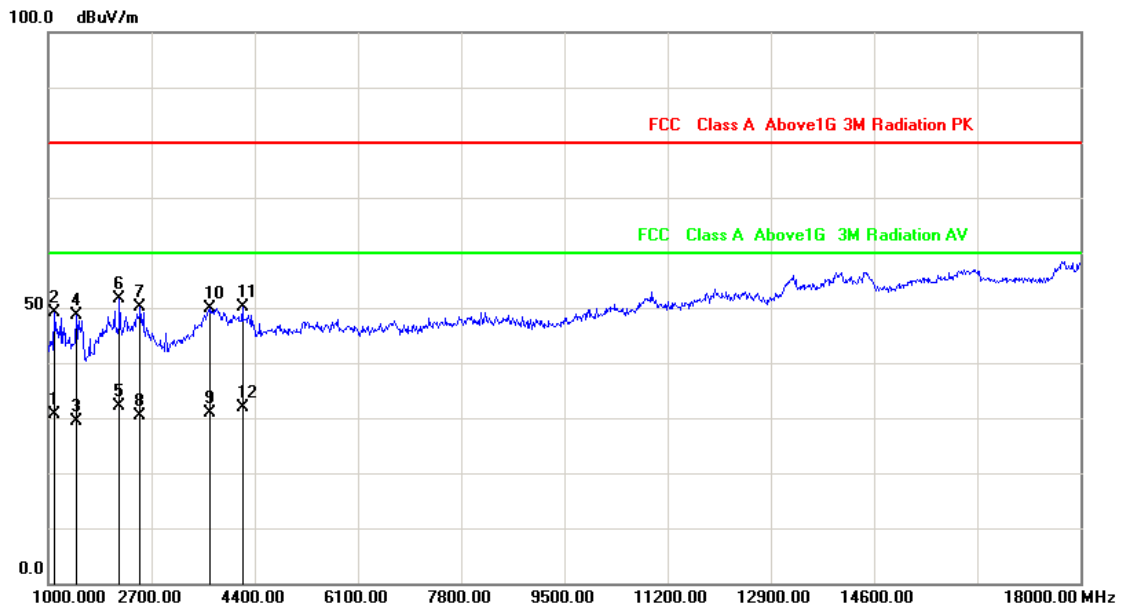


| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|------|-------------|---------------|
| 1 | 1102.000 | -16.89 | 61.55 | 44.66 | 80.00 | -35.34 | peak | 200 | 0 |
| 2 | 1102.000 | -16.89 | 42.87 | 25.98 | 60.00 | -34.02 | AVG | 200 | 0 |
| 3 | 1561.000 | -14.67 | 59.01 | 44.34 | 80.00 | -35.66 | peak | 100 | 67 |
| 4 | 1561.000 | -14.67 | 40.27 | 25.60 | 60.00 | -34.40 | AVG | 100 | 67 |
| 5 | 2173.000 | -11.40 | 57.05 | 45.65 | 80.00 | -34.35 | peak | 100 | 331 |
| 6 | 2173.000 | -11.40 | 38.41 | 27.01 | 60.00 | -32.99 | AVG | 100 | 331 |
| 7 | 2513.000 | -9.91 | 55.22 | 45.31 | 80.00 | -34.69 | peak | 200 | 29 |
| 8 | 2513.000 | -9.91 | 36.29 | 26.38 | 60.00 | -33.62 | AVG | 200 | 29 |
| 9 | 2938.000 | -8.68 | 56.72 | 48.04 | 80.00 | -31.96 | peak | 200 | 215 |
| 10 | 2938.000 | -8.68 | 36.95 | 28.27 | 60.00 | -31.73 | AVG | 200 | 215 |
| 11 | 3346.000 | -7.03 | 54.05 | 47.02 | 80.00 | -32.98 | peak | 200 | 154 |
| 12 | 3346.000 | -7.03 | 36.02 | 28.99 | 60.00 | -31.01 | AVG | 200 | 154 |

Note: Measurement Level = Reading Level + Correct Factor



| | | | |
|------------------|---|--------------------|----------------------|
| Test Mode : | Mode 2: Full system for DH-IPC-HDBW4431FN-AS with POE | | |
| DC Power : | POE 48V | Ant. Polarization: | Vertical |
| Equipment : | IP CAMERA | Model No : | DH-IPC-HDBW4431FN-AS |
| Temp : | 25°C | Humidity : | 53% |
| Pressure(mbar) : | 1002 | Date : | 2016/08/28 |



| No. | Frequency (MHz) | Factor (dB/m) | Reading (dBuV) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. | Height (cm) | Azimuth (deg) |
|-----|-----------------|---------------|----------------|----------------|----------------|-------------|------|-------------|---------------|
| 1 | 1100.000 | -16.90 | 47.62 | 30.72 | 60.00 | -29.28 | AVG | 100 | 113 |
| 2 | 1102.000 | -16.89 | 65.99 | 49.10 | 80.00 | -30.90 | peak | 100 | 113 |
| 3 | 1458.000 | -15.22 | 44.70 | 29.48 | 60.00 | -30.52 | AVG | 100 | 210 |
| 4 | 1459.000 | -15.21 | 63.76 | 48.55 | 80.00 | -31.45 | peak | 100 | 210 |
| 5 | 2172.000 | -11.41 | 43.51 | 32.10 | 60.00 | -27.90 | AVG | 100 | 7 |
| 6 | 2173.000 | -11.40 | 62.98 | 51.58 | 80.00 | -28.42 | peak | 100 | 7 |
| 7 | 2513.000 | -9.91 | 59.96 | 50.05 | 80.00 | -29.95 | peak | 200 | 39 |
| 8 | 2514.000 | -9.91 | 40.29 | 30.38 | 60.00 | -29.62 | AVG | 200 | 39 |
| 9 | 3668.000 | -5.66 | 36.50 | 30.84 | 60.00 | -29.16 | AVG | 100 | 294 |
| 10 | 3669.000 | -5.65 | 55.45 | 49.80 | 80.00 | -30.20 | peak | 100 | 294 |
| 11 | 4196.000 | -4.17 | 54.34 | 50.17 | 80.00 | -29.83 | peak | 200 | 116 |
| 12 | 4197.000 | -4.17 | 35.97 | 31.80 | 60.00 | -28.20 | AVG | 200 | 116 |

Note: Measurement Level = Reading Level + Correct Factor

Test engineer: *Sun. Zhang*

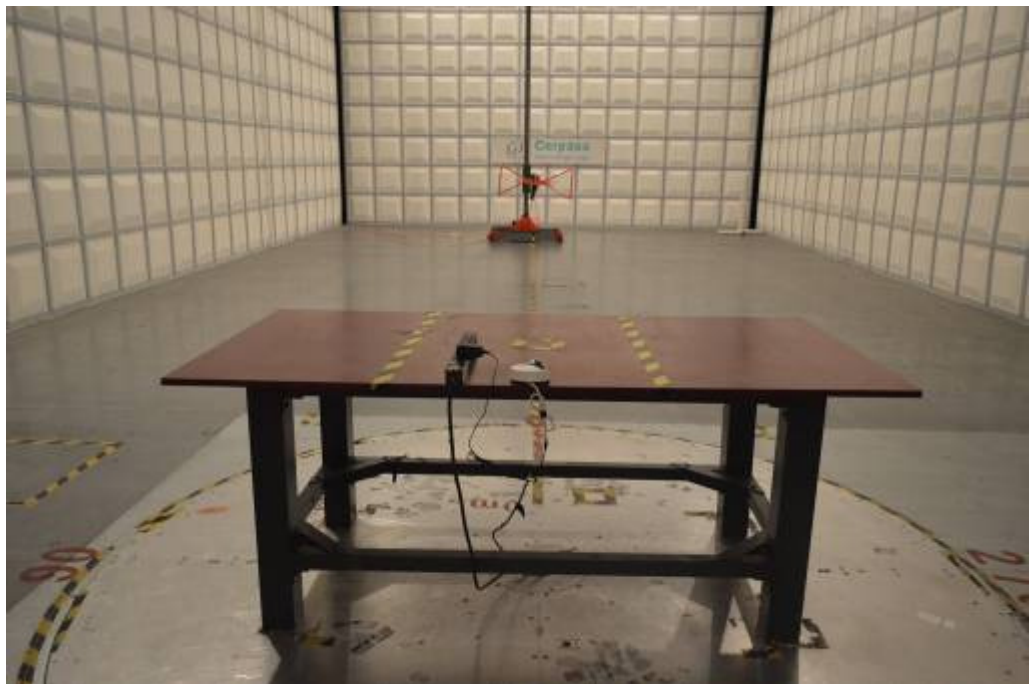


4.7. Test Photographs (30MHz ~ 1000MHz)

Front View



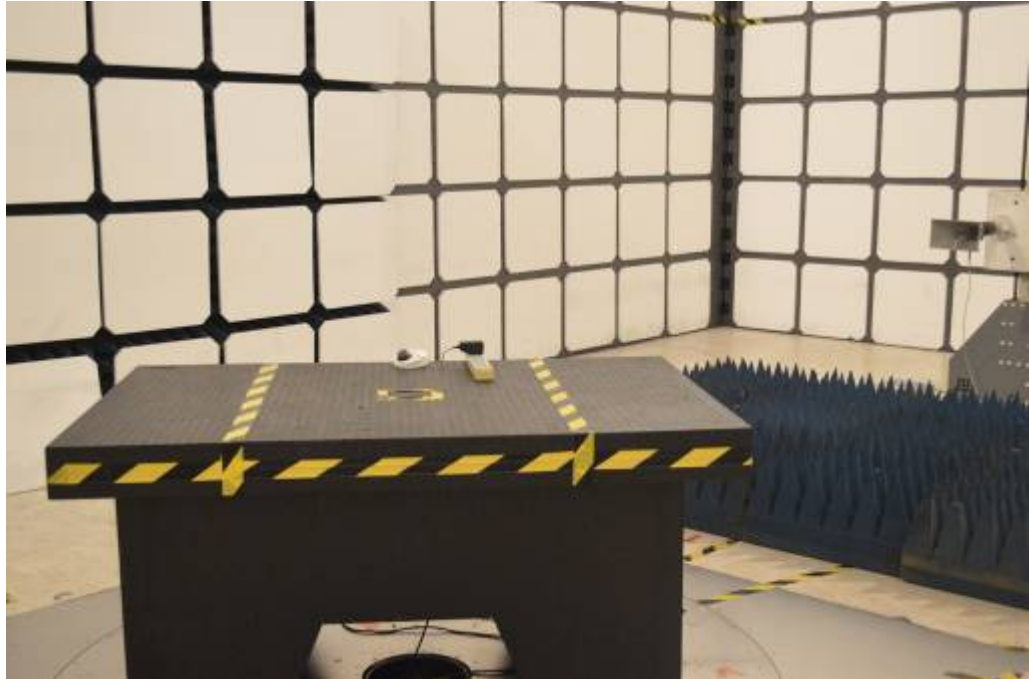
Rear View



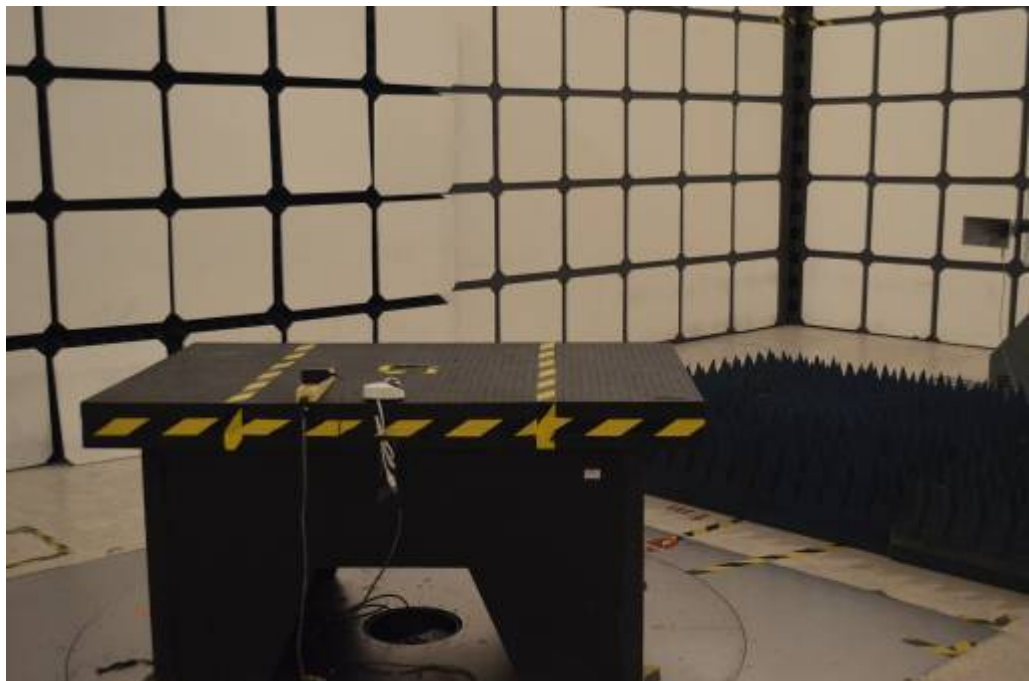


4.8. Test Photographs (1000MHz ~ 18000MHz)

Front View



Rear View





5. Photographs of EUT

1) EUT Photo(DH-IPC-HDBW4231FN-AS)



2) EUT Photo





3) EUT Photo



4) EUT Photo





5) EUT Photo(DH-IPC-HDBW4431FN-AS)



6) EUT Photo





7) EUT Photo



8) EUT Photo





9) EUT Photo



10) EUT Photo





11) EUT Photo

