

EMC Test Report

Project No. : 1504012
Equipment Model Name : Network Video Recorder
: SVR-2104, SVR-2108, SVR-2116, NVR-2104,
NVR-2108, NVR-2116, NVR-0404, NVR-0408,
NVR-0416, NVR-204Mk 2, NVR-208, NVR-216,
NVR04, NVR08, NVR16
Applicant Address : SEEnergy Corp.
: 4F, No. 61, DongXing Rd, Xinyi District Taipei 11070,
Taiwan
Date of Receipt : Apr. 07, 2015
Date of Test : Apr. 07, 2015 ~ Jun. 11, 2015
Issued Date : Jun. 12, 2015
Tested by : BTL Inc.

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Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**) of **R.O.C.**, or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

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BTL's laboratory quality assurance procedures are in compliance with the **ISO Guide 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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REPORT ISSUED HISTORY

| Issue No. | Description | Issued Date |
|-------------------|----------------|---------------|
| BTL-EMC-1-1504012 | Original Issue | Jun. 12, 2015 |

1. CERTIFICATION

Equipment : Network Video Recorder
Brand Name : SEEnergy
Model Name : SVR-2104, SVR-2108, SVR-2116, NVR-2104, NVR-2108, NVR-2116,
NVR-0404, NVR-0408, NVR-0416, NVR-204Mk 2, NVR-208, NVR-216,
NVR04, NVR08, NVR16
Applicant : SEEnergy Corp.
Manufacturer : SEEnergy Corp.
Address : 4F, No. 61, DongXing Rd, Xinyi District Taipei, 11070 Taiwan
Factory : SEEnergy Corp.
Address : 4F, No. 61, DongXing Rd, Xinyi District Taipei, 11070 Taiwan
Date of Test : Apr. 07, 2015 ~ Jun. 11, 2015
Standard(s) : EN 55022: 2010+AC: 2011 Class A
EN 61000-3-2: 2006 +A1: 2009 +A2: 2009 Class A
EN 61000-3-3: 2013
EN 55024: 2010
IEC 61000-4-2: 2008
IEC 61000-4-3: 2006 +A1: 2007 +A2: 2010
IEC 61000-4-4: 2012
IEC 61000-4-5: 2014
IEC 61000-4-6: 2013
IEC 61000-4-8: 2009
IEC 61000-4-11: 2004

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-EMC-1-1504012) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

| Emission | | | | |
|-----------------------------|---|---------|----------|--------|
| Standard(s) | Test Item | Limit | Judgment | Remark |
| EN 55022: 2010 +AC: 2011 | Conducted emission | Class A | PASS | |
| | Conducted emission at telecommunication ports | Class A | PASS | |
| | Radiated emission Below 1 GHz | Class A | PASS | |
| | Radiated emission Above 1 GHz | Class A | PASS | |

| Standard(s) | Test Item | Limit | Judgment | Remark |
|---|---|---------|----------|----------|
| EN 61000-3-2: 2006 +A1: 2009 +A2: 2009 | Harmonic current emissions | Class A | PASS | NOTE (3) |
| EN 61000-3-3: 2013 | Voltage changes, voltage fluctuations and flicker | ----- | PASS | |

| Immunity EN 55024: 2010 | | | | |
|--|---|----------------------|----------|----------|
| Section | Test Item | Criterion | Judgment | Remark |
| IEC 61000-4-2: 2008 | Electrostatic discharge immunity | B | PASS | |
| IEC 61000-4-3: 2006 +A1: 2007 +A2: 2010 | Radiated, radio-frequency, electromagnetic field immunity | A | PASS | |
| IEC 61000-4-4: 2012 | Electrical fast transient/burst immunity | B | PASS | |
| IEC 61000-4-5: 2014 | Surge immunity | B/C | PASS | NOTE (4) |
| IEC 61000-4-6: 2013 | Immunity to conducted disturbances, induced by radio-frequency fields | A | PASS | |
| IEC 61000-4-8: 2009 | Power frequency magnetic field immunity | A | PASS | |
| IEC 61000-4-11: 2004 | Voltage dips, short interruptions and voltage variations immunity | B / C / C NOTE(5) | PASS | |

NOTE:

- (1) "N/A" denotes test is not applicable in this Test Report.
- (2) If the EUT's max operating frequency does not exceed 108 MHz, the test will not be performed.
- (3) If the EUT's category is Class D and power consumption is less than 75W, there is no limit applied.
- (4) Performance Criterion **C** for signal ports and telecommunication ports.
Performance Criterion **B** for input d.c. power port and a.c. power ports.
- (5) Voltage Dips: >95% reduction – Performance Criterion **B**
Voltage Dips: 30% reduction – Performance Criterion **C**
Voltage Interruptions: >95% reduction – Performance Criterion **C**

2.1 TEST FACILITY

The test facilities used to collect the test data in this report:

Conducted emission Test:

C03: (VCCI RN: C-4461)

B1, No. 37, Lane 365, YangGuang St., NeiHu District 114, Taipei, Taiwan.

Conducted emission at telecommunication ports Test:

C03: (VCCI RN: T-1667)

B1, No. 37, Lane 365, YangGuang St., NeiHu District 114, Taipei, Taiwan.

Radiated emission Test (Below 1 GHz):

OS02: (VCCI RN: R-2669; FCC RN: 95335; FCC DN: TW1010)

No.132-1, Ln. 329, Sec. 2, Balian Rd., Xizhi Dist., New Taipei City 221, Taiwan (R.O.C.)

Radiated emission Test (Above 1 GHz):

CB08: (VCCI RN: G-91; FCC RN: 614388; FCC DN: TW1054; IC Assigned Code: 4428C-1)

1F., No. 61, Ln. 77, Sing-ai Rd., Neihu Dist., Taipei City 114, Taiwan (R.O.C.)

The immunity test facilities are located at:

No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

2.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95%**.

The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2.

A. Conducted emission test:

| Test Site | Measurement Frequency Range | U,(dB) | Note |
|-----------|-----------------------------|--------|------|
| C03 | 150 kHz ~ 30 MHz | 1.94 | |

B. Conducted emission at telecommunication ports test:

| Test Site | Measurement Frequency Range | U,(dB) | Note |
|-----------|-----------------------------|--------|------|
| C03 | 150 kHz ~ 30 MHz | 1.94 | |

C. Radiated emission test:

| Test Site | Measurement Frequency Range | Ant. H / V | U,(dB) | Note |
|-----------|-----------------------------|------------|--------|------|
| OS02 | 30 MHz ~ 200 MHz | V | 2.48 | |
| | 30 MHz ~ 200 MHz | H | 2.16 | |
| | 200 MHz ~ 1, 000 MHz | V | 2.50 | |
| | 200 MHz ~ 1, 000 MHz | H | 2.66 | |

| Test Site | Item | Measurement Frequency Range | Uncertainty | Note | |
|-----------|-------------------------|-----------------------------|---------------|---------|--|
| CB08 | Radiated emission at 3m | Horizontal Polarization | 30 - 200MHz | 3.35 dB | |
| | | | 200 - 1000MHz | 3.11 dB | |
| | | | 1 - 18GHz | 3.97 dB | |
| | | | 18 - 40GHz | 4.01 dB | |
| | | Vertical Polarization | 30 - 200MHz | 3.22 dB | |
| | | | 200 - 1000MHz | 3.24 dB | |
| | | | 1 - 18GHz | 4.05 dB | |
| | | | 18 - 40GHz | 4.04 dB | |

D. Harmonic current emissions and Voltage changes, voltage fluctuations and flicker test:

| Item | Expanded Uncertainty | | Note |
|---|----------------------|-----------------------|------|
| Harmonic current emissions | Voltage | 0.04 % | |
| | Current | 191 % | |
| | Frequency | 2.8×10^{-10} | |
| Voltage changes, voltage fluctuations and flicker | Voltage | 0.04 % | |
| | Current | 191 % | |
| | Frequency | 2.8×10^{-10} | |

E. Immunity tests:

| Item | Expanded Uncertainty | | Note |
|---|----------------------|-----------------------|---------------------|
| Electrostatic Discharge Immunity | Voltage | 1.6 % | |
| | Timing | 2.8 % | |
| Radiated, Radio-frequency, Electromagnetic Field Immunity | 2.66 dB | | 80MHz - 2.5GHz, k=2 |
| Electrical Fast Transient/Burst Immunity | Voltage | 1.6 % | |
| | Frequency | 2.8×10^{-10} | |
| | Timing | 2.8 % | |
| Surge Immunity | Voltage | 1.6 % | |
| | Timing | 2.8 % | |
| Immunity to Conducted Disturbances, Induced by Radio-frequency Fields | CDN | 1.75 dB | 150KHz - 80MHz, k=2 |
| | EM Clamp | 1.47 dB | 150KHz - 80MHz, k=2 |
| Power Frequency Magnetic Field Immunity | 1 % | | |
| Voltage Dips, Short Interruptions and Voltage Variations Immunity | Voltage | 1.6 % | |
| | Timing | 2.8 % | |

Our calculated Measurement Instrumentation Uncertainty is shown in the tables above.

These are our U_{lab} values in CISPR 16-4-2 terminology.

Since Table 1 of CISPR 16-4-2 has values of measurement instrumentation uncertainty, called U_{CISPR} , as follows:

Conducted Disturbance (mains port) – 150 kHz – 30 MHz : 3.6 dB

Radiated Disturbance (electric field strength on an open area test site or alternative test site) – 30 MHz – 1000 MHz : 5.2 dB

It can be seen that our U_{lab} values are smaller than U_{CISPR} .

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

| | |
|----------------------|--|
| Equipment | Network Video Recorder |
| Brand Name | SEEnergy |
| Model Name | SVR-2104, SVR-2108, SVR-2116, NVR-2104, NVR-2108, NVR-2116, NVR-0404, NVR-0408, NVR-0416, NVR-204Mk 2, NVR-208, NVR-216, NVR04, NVR08, NVR16 |
| OEM Brand/Model Name | N/A |
| Model Difference | Different model distribute to different area. |
| Power Source | DC voltage supplied from AC Adapter. Brand / Model: Ktec / KSAH1200400T1M2 |
| Power Rating | I/P: 100-240V~ 50/60Hz 102-139VA 1.2A O/P: DC 12V 4.0A |

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2. The EUT's operating frequency is 1 GHz.

3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

| Pretest Test Mode | Description |
|-------------------|---|
| Mode 1 | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) |
| Mode 2 | PREVIEW+PLAYBACK (ADAPTER: FSP065-REBN2) |
| Mode 3 | PREVIEW+RECORD (ADAPTER: EXA0904YH) |

| Conducted emission test | |
|-------------------------|---|
| Final Test Mode | Description |
| Mode 1 | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) |

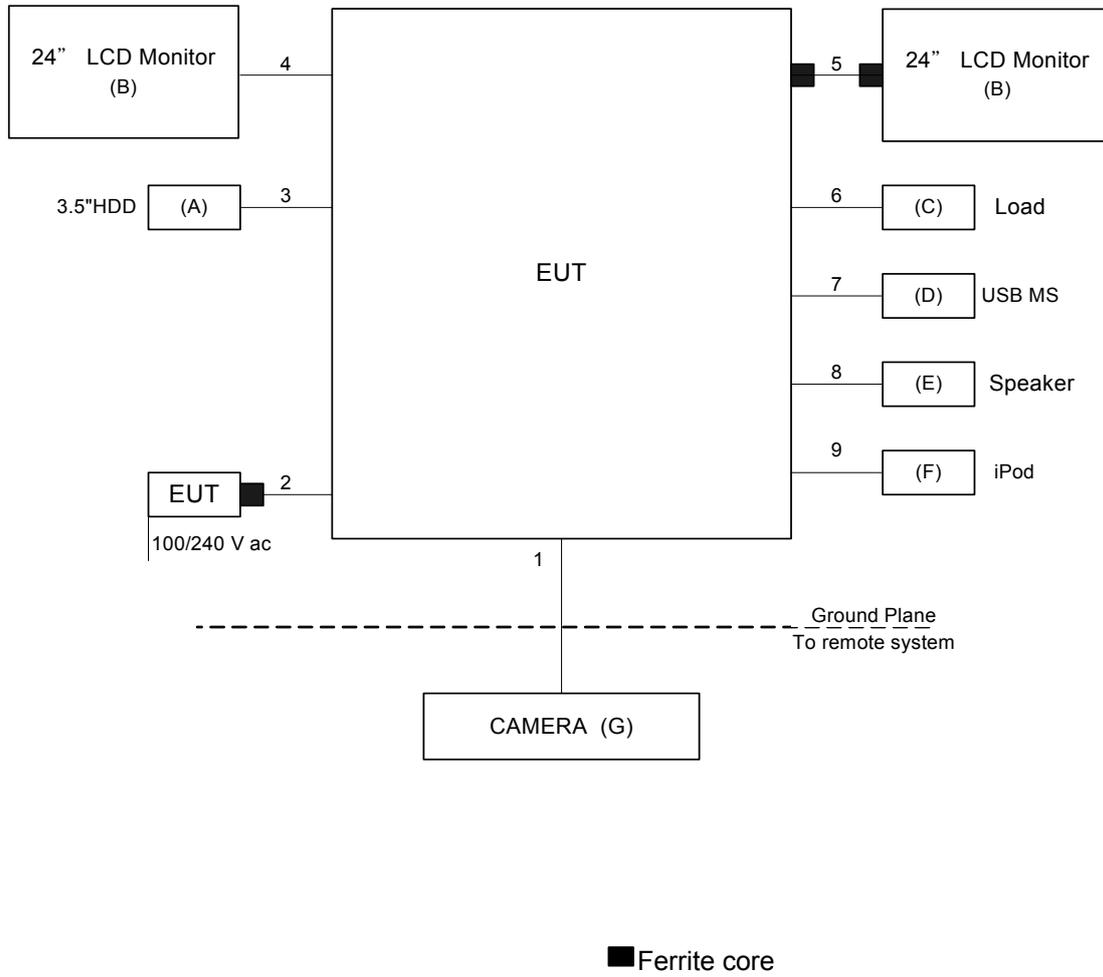
| Conducted emission at telecommunication ports test | |
|--|---|
| Final Test Mode | Description |
| Mode 1 | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) (ETHERNET 1G-1G) |
| Mode 1 | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) (ETHERNET 100M-100M) |
| Mode 1 | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) (ETHERNET 10M-10M) |

| Radiated emission test | |
|------------------------|---|
| Final Test Mode | Description |
| Mode 1 | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) |

| Harmonic current emissions & Voltage changes, voltage fluctuations and flicker test | |
|---|---|
| Final Test Mode | Description |
| Mode 1 | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) |

| Immunity tests | |
|-----------------|---|
| Final Test Mode | Description |
| Mode 1 | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) |

3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment | Mfr/Brand | Model/Type No. | FCC ID | Series No. | Note |
|------|--------------------------|-----------|---------------------|--------|---------------------------|------|
| A | 3.5" External Hard Drive | WD | WDBACW001 0HBK-SESN | DOC | WCAV5J749731 | |
| B | 24" LCD Monitor | DELL | U2410f | DOC | CN-OJ257M-72872-0 9J-067L | |
| C | Load | N/A | N/A | N/A | N/A | |
| D | USB Mouse | DELL | MS111-L | DOC | CN-09RRC7-44751-1 7J-OH1F | |
| E | Speaker | N/A | N/A | N/A | N/A | |
| F | iPod nano | Apple | A1137 | DOC | YM63604QUPR | |
| G | CAMERA | N/A | N/A | N/A | N/A | |

| Item | Shielded Type | Ferrite Core | Length | Note |
|------|---------------|--------------|--------|-------------|
| 1 | NO | NO | 10m | RJ-45 Cable |
| 2 | YES | YES | 1.6m | Power Cable |
| 3 | YES | NO | 1.2m | USB Cable |
| 4 | YES | NO | 1.8m | HDMI Cable |
| 5 | YES | YES | 1.8m | D-SUB Cable |
| 6 | NO | NO | 1m | Power Cable |
| 7 | YES | NO | 1.7m | USB Cable |
| 8 | NO | NO | 1.5m | Audio Cable |
| 9 | NO | NO | 1.8m | Audio Cable |

Note:

(1) The support equipment was authorized by Declaration of Conformity (DOC).

4. EMC EMISSION TEST

4.1 CONDUCTED EMISSION TEST

4.1.1 LIMITS (FREQUENCY RANGE 150 KHZ-30MHZ)

| FREQUENCY (MHz) | Class A (dBuV) | | Class B (dBuV) | |
|--------------------|----------------|---------|----------------|-----------|
| | Quasi-peak | Average | Quasi-peak | Average |
| 0.15 - 0.5 | 79.00 | 66.00 | 66 - 56 * | 56 - 46 * |
| 0.50 - 5.0 | 73.00 | 60.00 | 56.00 | 46.00 |
| 5.0 - 30.0 | 73.00 | 60.00 | 60.00 | 50.00 |

NOTE:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.
- (3) The test result calculated as following:
 Measurement Value = Reading Level + Correct Factor
 Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)
 Margin Level = Measurement Value – Limit Value

4.1.2 MEASUREMENT INSTRUMENTS LIST

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|-------------------------|--------------|-----------------------------|------------|------------------|
| 1 | TWO-LINE V-NETWORK | R&S | ENV216 | 101051 | Jan. 15, 2016 |
| 2 | Test Cable | TIMES | CFD300-NL | C03 | Jun. 11, 2016 |
| 3 | EMI Test Receiver | R&S | ESCI | 100080 | May. 11, 2016 |
| 4 | Measurement Software | EZ | EZ_EMCC (Version NB-03A) | N/A | N/A |

Remark: "N/A" denotes No Model Name, No Serial No. or No Calibration specified.

4.1.3 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

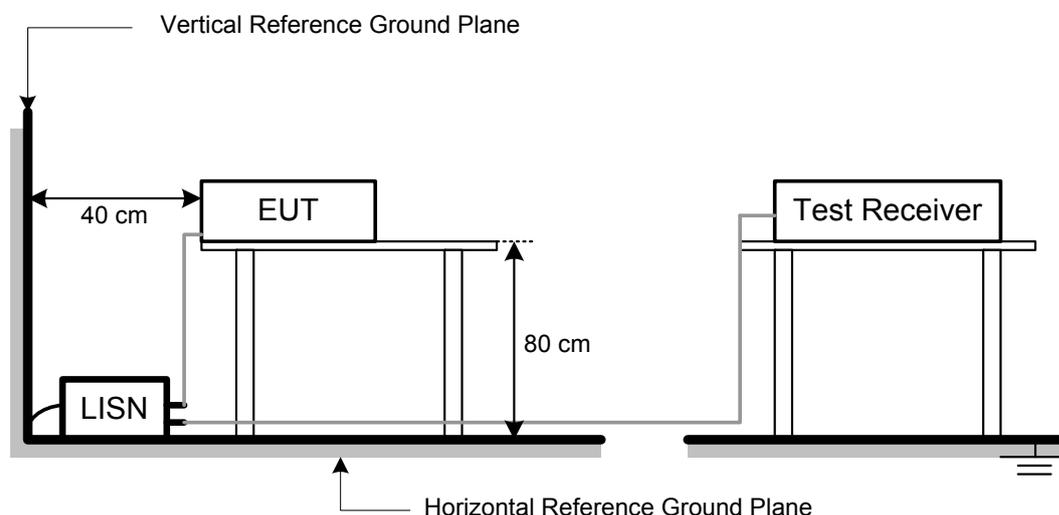
NOTE:

- a. Reading in which marked as Peak, QP or AVG means measurements by using are Quasi-Peak or Average Mode with Detector BW=9 kHz (6 dB Bandwidth).
- b. All readings are Peak Mode value unless otherwise stated QP or AVG in column of Note. If the Peak or QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only Peak or QP Mode was measured, but AVG Mode didn't perform.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



4.1.6 EUT OPERATING CONDITIONS

The EUT exercise program used during radiated and/or conducted emission measurement was designed to exercise the various system components in a manner similar to a typical use. The sequence used is:

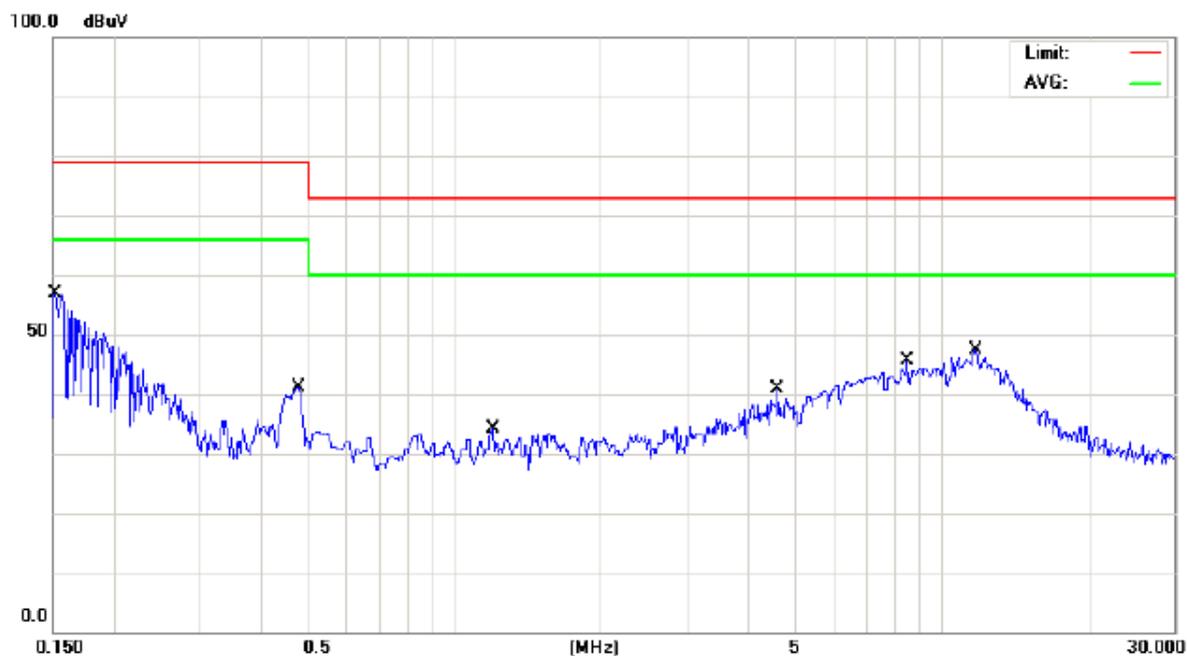
1. Read (write) from (to) mass storage device (External HDD).
2. Receive image from remote IP Camera
3. Send image to video port device (Monitor).
4. Send/Receive audio to/from audio devices (Speaker and iPod).
5. Repeated from 1 to 4 continuously.

As the mouse is a strictly input device, no data is transmitted to (from) it during test. It is, however, continuously scanned for data input activity

4.1.7 TEST RESULTS

| | | | |
|--------------|---|-------------------|----------|
| EUT | Network Video Recorder | Model Name | SVR-2104 |
| Temperature | 24 °C | Relative Humidity | 48% |
| Test Voltage | AC 230V/50Hz | | |
| Test Mode | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) | | |

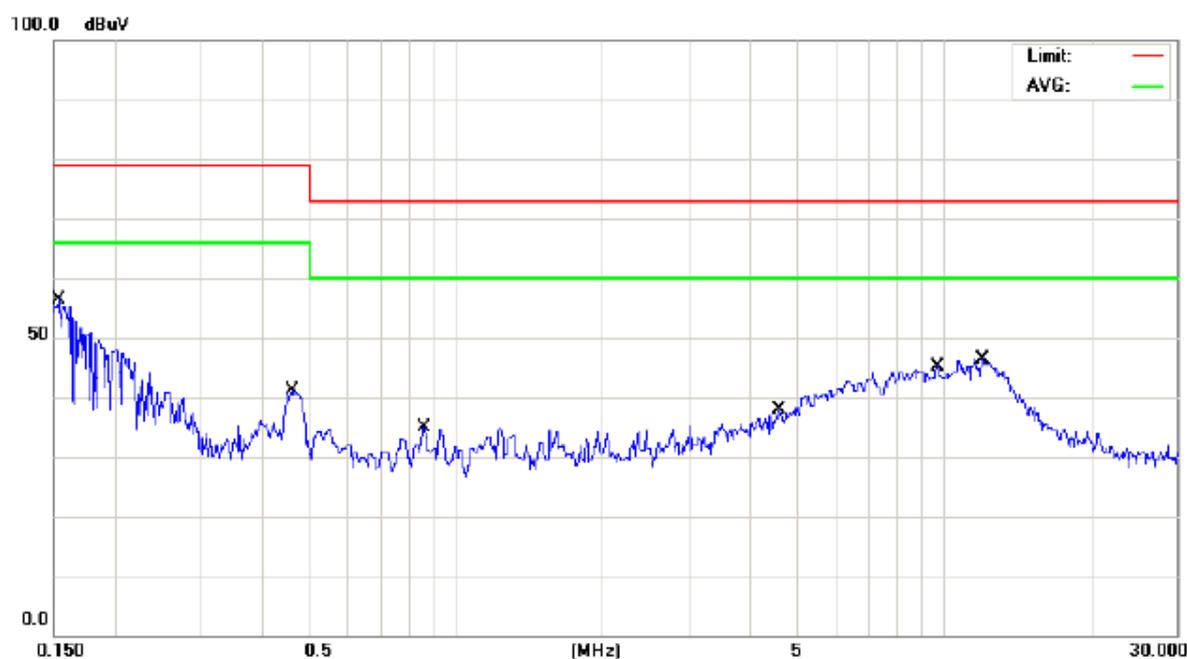
Phase: Line



| No. Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV | Limit dBuV | Margin dB | Detector | Comment |
|---------|--------------|--------------------------|-------------------------|--------------------------|---------------|--------------|----------|---------|
| 1 | 0.1514 | 35.80 | 9.67 | 45.47 | 79.00 | -33.53 | QP | |
| 2 | 0.1514 | 22.40 | 9.67 | 32.07 | 66.00 | -33.93 | AVG | |
| 3 | 0.4762 | 25.10 | 9.67 | 34.77 | 79.00 | -44.23 | QP | |
| 4 | 0.4762 | 16.40 | 9.67 | 26.07 | 66.00 | -39.93 | AVG | |
| 5 | 1.2020 | 15.50 | 9.65 | 25.15 | 73.00 | -47.85 | QP | |
| 6 | 1.2020 | 8.10 | 9.65 | 17.75 | 60.00 | -42.25 | AVG | |
| 7 | 4.5949 | 22.10 | 9.75 | 31.85 | 73.00 | -41.15 | QP | |
| 8 | 4.5949 | 16.30 | 9.75 | 26.05 | 60.00 | -33.95 | AVG | |
| 9 | 8.5000 | 29.10 | 9.86 | 38.96 | 73.00 | -34.04 | QP | |
| 10 | 8.5000 | 22.70 | 9.86 | 32.56 | 60.00 | -27.44 | AVG | |
| 11 | 11.7000 | 31.20 | 9.92 | 41.12 | 73.00 | -31.88 | QP | |
| 12 * | 11.7000 | 26.20 | 9.92 | 36.12 | 60.00 | -23.88 | AVG | |

| | | | |
|--------------|---|-------------------|----------|
| EUT | Network Video Recorder | Model Name | SVR-2104 |
| Temperature | 24 °C | Relative Humidity | 48% |
| Test Voltage | AC 230V/50Hz | | |
| Test Mode | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) | | |

Phase: Neutral



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV | Limit dBuV | Margin dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|--------------|----------|---------|
| 1 | | 0.1535 | 35.60 | 9.66 | 45.26 | 79.00 | -33.74 | QP | |
| 2 | | 0.1535 | 22.70 | 9.66 | 32.36 | 66.00 | -33.64 | AVG | |
| 3 | | 0.4601 | 26.00 | 9.66 | 35.66 | 79.00 | -43.34 | QP | |
| 4 | | 0.4601 | 18.80 | 9.66 | 28.46 | 66.00 | -37.54 | AVG | |
| 5 | | 0.8600 | 17.70 | 9.65 | 27.35 | 73.00 | -45.65 | QP | |
| 6 | | 0.8600 | 9.90 | 9.65 | 19.55 | 60.00 | -40.45 | AVG | |
| 7 | | 4.5949 | 22.30 | 9.75 | 32.05 | 73.00 | -40.95 | QP | |
| 8 | | 4.5949 | 17.20 | 9.75 | 26.95 | 60.00 | -33.05 | AVG | |
| 9 | | 9.7000 | 29.30 | 9.89 | 39.19 | 73.00 | -33.81 | QP | |
| 10 | | 9.7000 | 24.00 | 9.89 | 33.89 | 60.00 | -26.11 | AVG | |
| 11 | | 11.9500 | 31.10 | 9.93 | 41.03 | 73.00 | -31.97 | QP | |
| 12 | * | 11.9500 | 26.20 | 9.93 | 36.13 | 60.00 | -23.87 | AVG | |

4.2 CONDUCTED EMISSION AT TELECOMMUNICATION PORTS TEST

4.2.1 LIMITS

Voltage Limit:

| FREQUENCY (MHz) | Class A (dBuV) | | Class B (dBuV) | |
|------------------|----------------|---------|----------------|---------|
| | Quasi-peak | Average | Quasi-peak | Average |
| 0.15 -0.5 | 97-87* | 84-74* | 84-74* | 74-64* |
| 0.5 -30.0 | 87 | 74 | 74 | 64 |

Current Limit:

| FREQUENCY (MHz) | Class A (dBuA) | | Class B (dBuA) | |
|------------------|----------------|---------|----------------|---------|
| | Quasi-peak | Average | Quasi-peak | Average |
| 0.15 -0.5 | 53-43* | 40-30* | 40-30* | 30-20* |
| 0.5 -30.0 | 43 | 30 | 30 | 20 |

NOTE:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.
- (3) The test result calculated as following:
 Measurement Value = Reading Level + Correct Factor
 Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)
 Margin Level = Measurement Value – Limit Value

4.2.2 MEASUREMENT INSTRUMENTS LIST

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|-------------------------|--------------|-------------------------|------------|------------------|
| 1 | TWO-LINE V-NETWORK | R&S | ENV216 | 101051 | Jan. 15, 2016 |
| 2 | Test Cable | TIMES | CFD300-NL | C03 | Jun. 11, 2016 |
| 3 | EMI Test Receiver | R&S | ESCI | 100080 | May. 11, 2016 |
| 4 | Measurement Software | EZ | EZ_EMG (Version NB-03A) | N/A | N/A |
| 5 | 50Ω BNC TYPE Terminator | N/A | N/A | 04 | Jul. 03, 2015 |
| 6 | ISN | FCC | F-070306-1057-1-09 | 100363 | Jun. 19, 2015 |

Remark: "N/A" denotes No Model Name, No Serial No. or No Calibration specified.

4.2.3 TEST PROCEDURE

- a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. ISN at least 80 cm from nearest part of EUT chassis.
- e. The communication function of EUT was executed and ISN was connected between EUT and associated equipment and the ISN was connected directly to reference ground plane.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

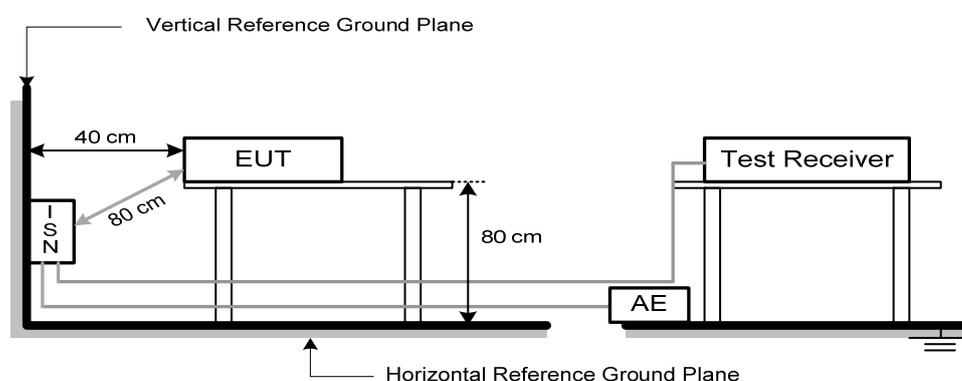
NOTE:

- a. Reading in which marked as Peak, QP or AVG means measurements by using are Quasi-Peak or Average Mode with Detector BW=9 kHz (6 dB Bandwidth).
- b. All readings are Peak Mode value unless otherwise stated QP or AVG in column of Note. If the Peak or QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only Peak or QP Mode was measured, but AVG Mode didn't perform.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP

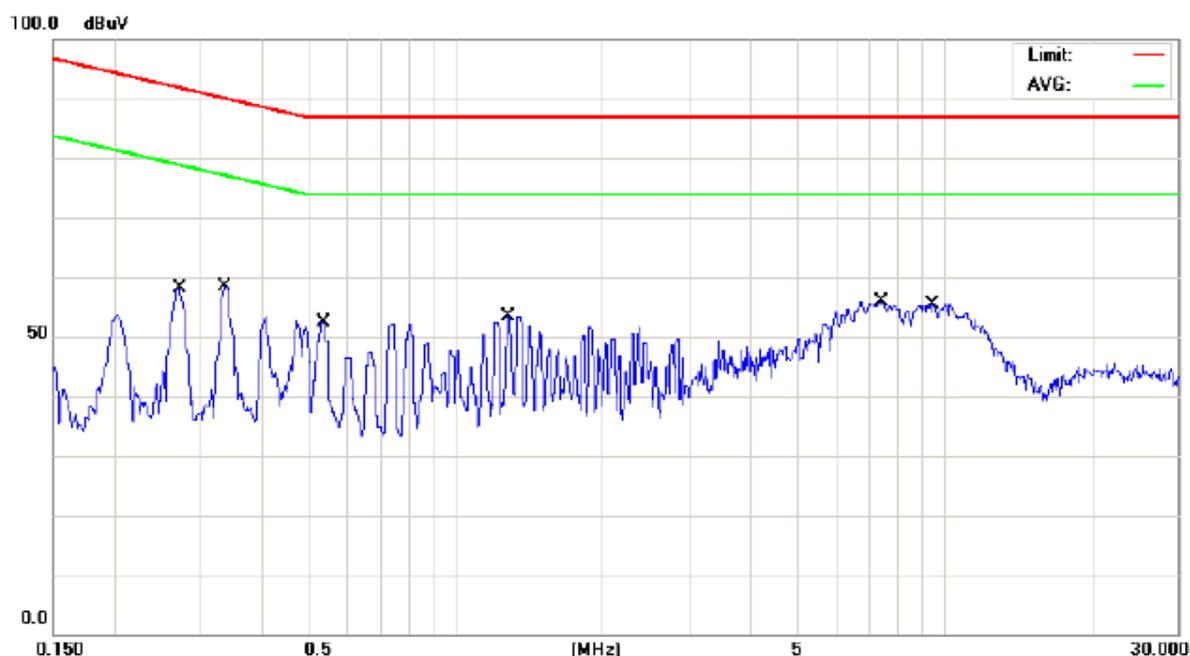


4.2.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

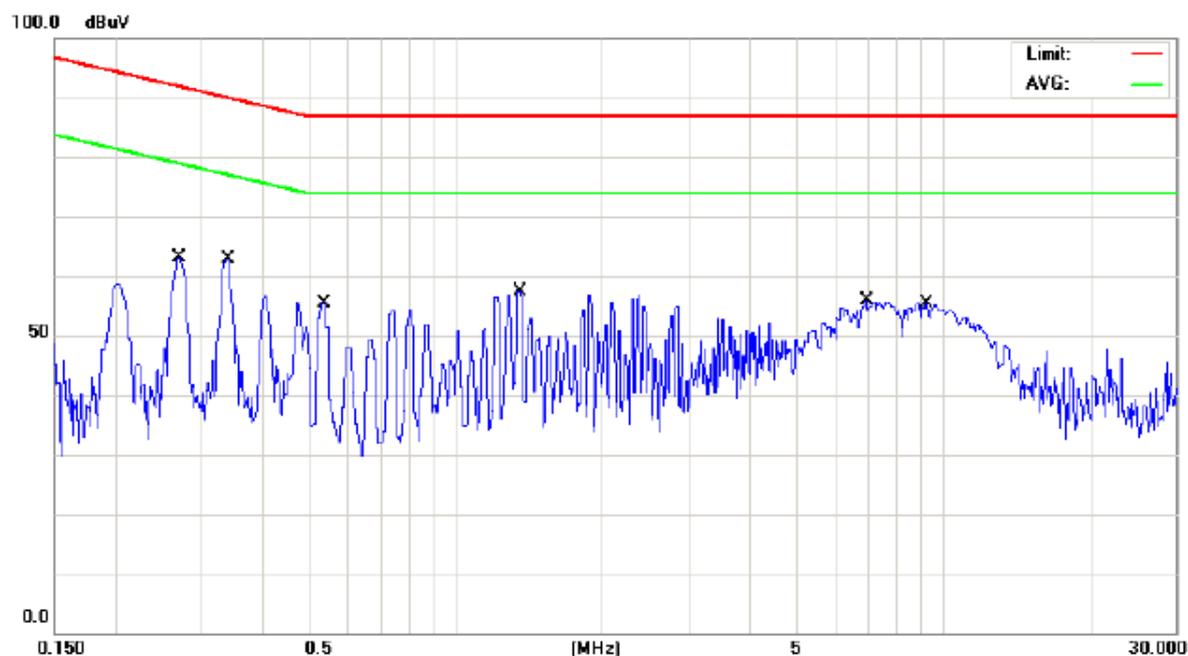
4.2.7 TEST RESULTS

| | | | |
|--------------|--|-------------------|----------|
| EUT | Network Video Recorder | Model Name | SVR-2104 |
| Temperature | 24 °C | Relative Humidity | 48% |
| Test Voltage | AC 230V/50Hz | | |
| Test Mode | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) (ETHERNET 1G-1G) | | |



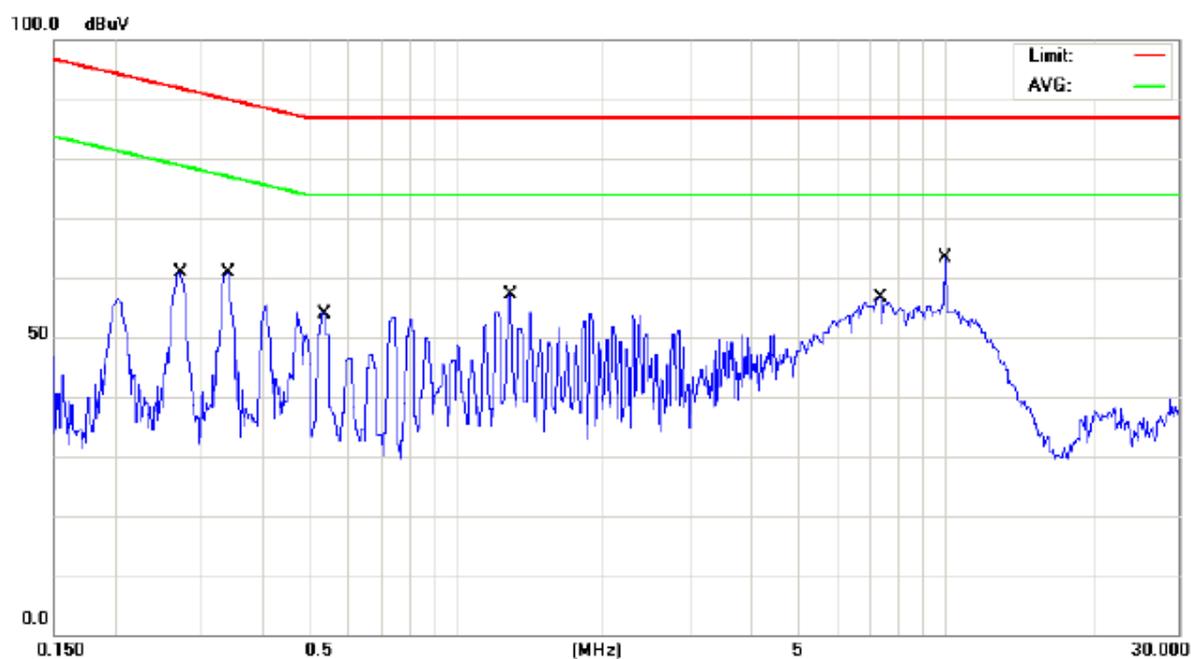
| No. Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV | Limit dBuV | Margin dB | Detector | Comment |
|---------|--------------|--------------------------|-------------------------|--------------------------|---------------|--------------|----------|---------|
| 1 | 0.2704 | 56.20 | 10.09 | 66.29 | 92.10 | -25.81 | QP | |
| 2 | 0.2704 | 55.50 | 10.09 | 65.59 | 79.10 | -13.51 | AVG | |
| 3 | 0.3369 | 58.40 | 10.07 | 68.47 | 90.28 | -21.81 | QP | |
| 4 * | 0.3369 | 57.60 | 10.07 | 67.67 | 77.28 | -9.61 | AVG | |
| 5 | 0.5360 | 45.40 | 10.04 | 55.44 | 87.00 | -31.56 | QP | |
| 6 | 0.5360 | 44.40 | 10.04 | 54.44 | 74.00 | -19.56 | AVG | |
| 7 | 1.2740 | 48.80 | 9.99 | 58.79 | 87.00 | -28.21 | QP | |
| 8 | 1.2740 | 47.60 | 9.99 | 57.59 | 74.00 | -16.41 | AVG | |
| 9 | 7.4000 | 41.30 | 10.16 | 51.46 | 87.00 | -35.54 | QP | |
| 10 | 7.4000 | 34.70 | 10.16 | 44.86 | 74.00 | -29.14 | AVG | |
| 11 | 9.4500 | 41.20 | 10.21 | 51.41 | 87.00 | -35.59 | QP | |
| 12 | 9.4500 | 35.60 | 10.21 | 45.81 | 74.00 | -28.19 | AVG | |

| | | | |
|--------------|--|-------------------|----------|
| EUT | Network Video Recorder | Model Name | SVR-2104 |
| Temperature | 24 °C | Relative Humidity | 48% |
| Test Voltage | AC 230V/50Hz | | |
| Test Mode | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) (ETHERNET 100M-100M) | | |



| No. Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV | Limit dBuV | Margin dB | Detector | Comment |
|---------|--------------|--------------------------|-------------------------|--------------------------|---------------|--------------|----------|---------|
| 1 | 0.2697 | 48.70 | 10.09 | 58.79 | 92.12 | -33.33 | QP | |
| 2 * | 0.2697 | 48.00 | 10.09 | 58.09 | 79.12 | -21.03 | AVG | |
| 3 | 0.3397 | 46.40 | 10.07 | 56.47 | 90.21 | -33.74 | QP | |
| 4 | 0.3397 | 45.70 | 10.07 | 55.77 | 77.21 | -21.44 | AVG | |
| 5 | 0.5360 | 40.30 | 10.04 | 50.34 | 87.00 | -36.66 | QP | |
| 6 | 0.5360 | 39.30 | 10.04 | 49.34 | 74.00 | -24.66 | AVG | |
| 7 | 1.3460 | 39.10 | 9.99 | 49.09 | 87.00 | -37.91 | QP | |
| 8 | 1.3460 | 37.20 | 9.99 | 47.19 | 74.00 | -26.81 | AVG | |
| 9 | 6.9500 | 40.80 | 10.14 | 50.94 | 87.00 | -36.06 | QP | |
| 10 | 6.9500 | 35.20 | 10.14 | 45.34 | 74.00 | -28.66 | AVG | |
| 11 | 9.2500 | 40.50 | 10.21 | 50.71 | 87.00 | -36.29 | QP | |
| 12 | 9.2500 | 34.70 | 10.21 | 44.91 | 74.00 | -29.09 | AVG | |

| | | | |
|--------------|--|-------------------|----------|
| EUT | Network Video Recorder | Model Name | SVR-2104 |
| Temperature | 24 °C | Relative Humidity | 48% |
| Test Voltage | AC 230V/50Hz | | |
| Test Mode | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) (ETHERNET 10M-10M) | | |



| No. Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV | Limit dBuV | Margin dB | Detector | Comment |
|---------|--------------|--------------------------|-------------------------|--------------------------|---------------|--------------|----------|---------|
| 1 | 0.2704 | 58.30 | 10.09 | 68.39 | 92.10 | -23.71 | QP | |
| 2 * | 0.2704 | 57.60 | 10.09 | 67.69 | 79.10 | -11.41 | AVG | |
| 3 | 0.3397 | 52.30 | 10.07 | 62.37 | 90.21 | -27.84 | QP | |
| 4 | 0.3397 | 51.30 | 10.07 | 61.37 | 77.21 | -15.84 | AVG | |
| 5 | 0.5360 | 44.40 | 10.04 | 54.44 | 87.00 | -32.56 | QP | |
| 6 | 0.5360 | 43.40 | 10.04 | 53.44 | 74.00 | -20.56 | AVG | |
| 7 | 1.2830 | 47.40 | 9.99 | 57.39 | 87.00 | -29.61 | QP | |
| 8 | 1.2830 | 46.10 | 9.99 | 56.09 | 74.00 | -17.91 | AVG | |
| 9 | 7.3500 | 41.60 | 10.16 | 51.76 | 87.00 | -35.24 | QP | |
| 10 | 7.3500 | 36.10 | 10.16 | 46.26 | 74.00 | -27.74 | AVG | |
| 11 | 10.0000 | 50.70 | 10.23 | 60.93 | 87.00 | -26.07 | QP | |
| 12 | 10.0000 | 38.90 | 10.23 | 49.13 | 74.00 | -24.87 | AVG | |

4.3 RADIATED EMISSION TEST

4.3.1 LIMITS

Below 1 GHz

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

NOTE:

- (1) The limit for radiated test was performed according to as following:
EN 55022.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m) = 20log Emission level (uV/m).
- (4) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
Margin Level = Measurement Value - Limit Value

Above 1 GHz

| FREQUENCY (MHz) | Class A (dBuV/m) (at 3m) | | Class B (dBuV/m) (at 3m) | |
|--------------------|--------------------------|---------|--------------------------|---------|
| | PEAK | AVERAGE | PEAK | AVERAGE |
| 1000 - 3000 | 76 | 56 | 70 | 50 |
| 3000 - 6000 | 80 | 60 | 74 | 54 |

NOTE:

- (1) The limit for radiated test was performed according to as following:
EN 55022.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m) = 20log Emission level (uV/m).
3m Emission level = 10m Emission level + 20log(10m/3m).
- (4) The test result calculated as following:
Measurement Value = Reading Level + Correct Factor
Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)
Margin Level = Measurement Value - Limit Value

FREQUENCY RANGE OF RADIATED MEASUREMENT (FOR UNINTENTIONAL RADIATORS)

| Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz) | Range (MHz) |
|---|--|
| Below 108 | 1000 |
| 108 - 500 | 2000 |
| 500 - 1000 | 5000 |
| Above 1000 | 5 th harmonic of the highest frequency or 6 GHz, whichever is lower |

4.3.2 MEASUREMENT INSTRUMENTS LIST

Below 1 GHz:

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|--------------------------|--------------|-------------------------|------------|------------------|
| 1 | Log-Bicon Antenna | Schwarzbeck | VULB 9160 | 3173 | Dec. 04, 2015 |
| 2 | Pre-Amplifier | Anritsu | MH648A | M98457 | May. 28, 2016 |
| 3 | Test Cable | TIMES | LMR-400 | 10M-OS01 | May. 28, 2016 |
| 4 | Test Cable | TIMES | LMR-400 | OS02 | May. 28, 2016 |
| 5 | EMI Test Receiver | R&S | ESCI | 100082 | Apr. 13, 2016 |
| 6 | System Controller (OS02) | CT | SC100 | N/A | N/A |
| 7 | Turn Table | Chance Most | CMTB-1.5 | N/A | N/A |
| 8 | Measurement Software | EZ | EZ EMC (Version NB-03A) | N/A | N/A |

Above 1 GHz:

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|----------------------|--------------------|-------------------------|------------|------------------|
| 1 | Horn Antenna (1G) | Schwarzbeck | BBHA 9120 D | 9120D-325 | Jan. 12, 2016 |
| 2 | Pre_Amplifier | Agilent | 8449B | 3008A01714 | Apr. 15, 2016 |
| 3 | Microflex Cable | HARBOUR INDUSTRIES | 27478 LL142 | 1M | May. 12, 2016 |
| 4 | Microflex Cable | AISI | S104-SMAP-1 | 10M | May. 14, 2016 |
| 5 | Microflex Cable | HARBOUR INDUSTRIES | 27478 LL142 | 3M | May. 12, 2016 |
| 6 | Spectrum Analyzer | R&S | FSP-40 | 100129 | Jan. 07, 2016 |
| 7 | Measurement Software | EZ | EZ EMC (Version NB-03A) | N/A | N/A |

Remark: "N/A" denotes No Model Name, No Serial No. or No Calibration specified.

4.3.3 TEST PROCEDURE

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m or 10 meter open area test site or semi anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- c. The initial step in collecting radiated emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- d. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

NOTE: (Below 1 GHz)

- a. Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode with Detector BW=120 kHz.
- b. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.

NOTE: (Above 1 GHz)

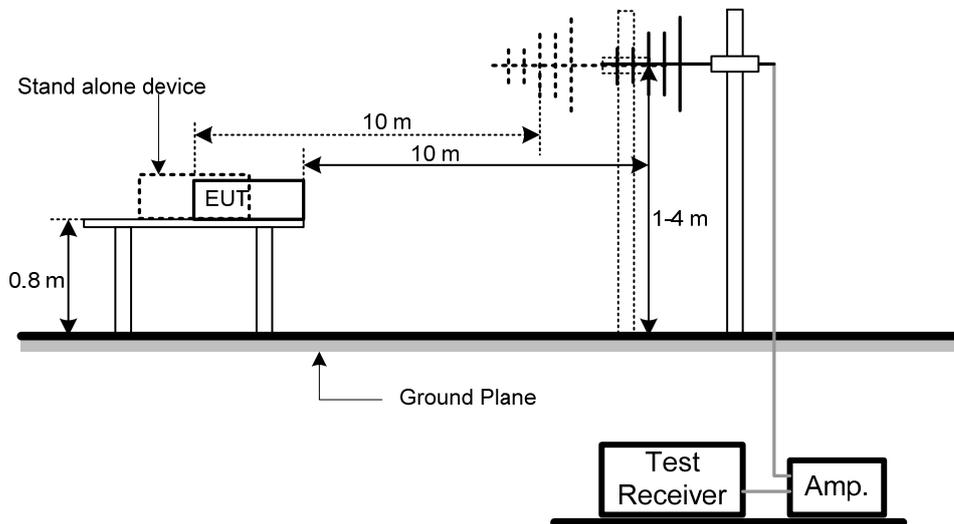
- a. Reading in which marked as Peak means measurements by using are Peak Mode with instrument setting in RBW= 1 MHz, VBW= 1 MHz.
Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW= 1 MHz, VBW= 10 Hz.
- b. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform.

4.3.4 DEVIATION FROM TEST STANDARD

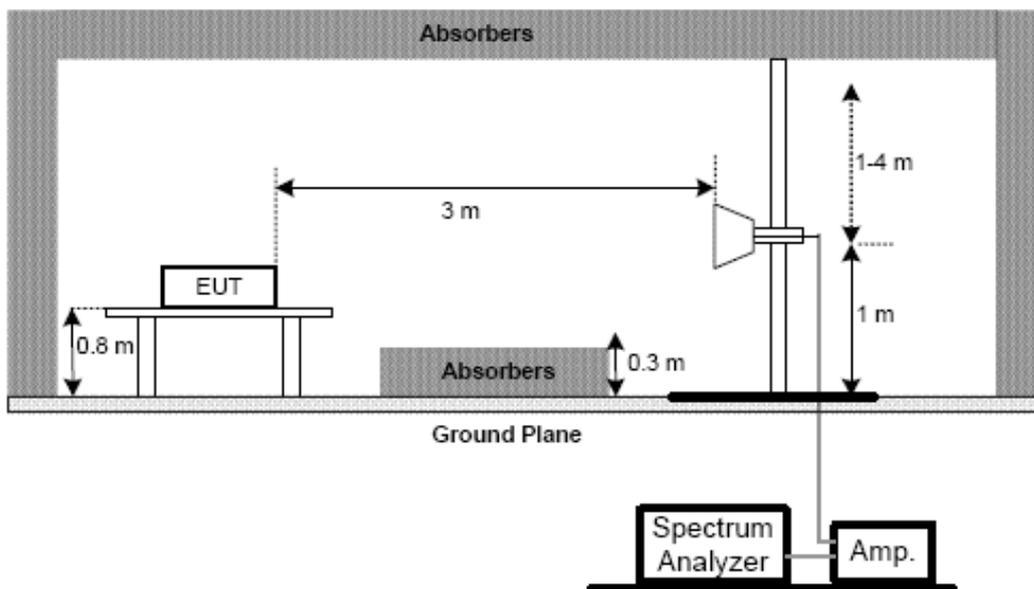
No deviation

4.3.5 TEST SETUP

Below 1 GHz



Above 1 GHz



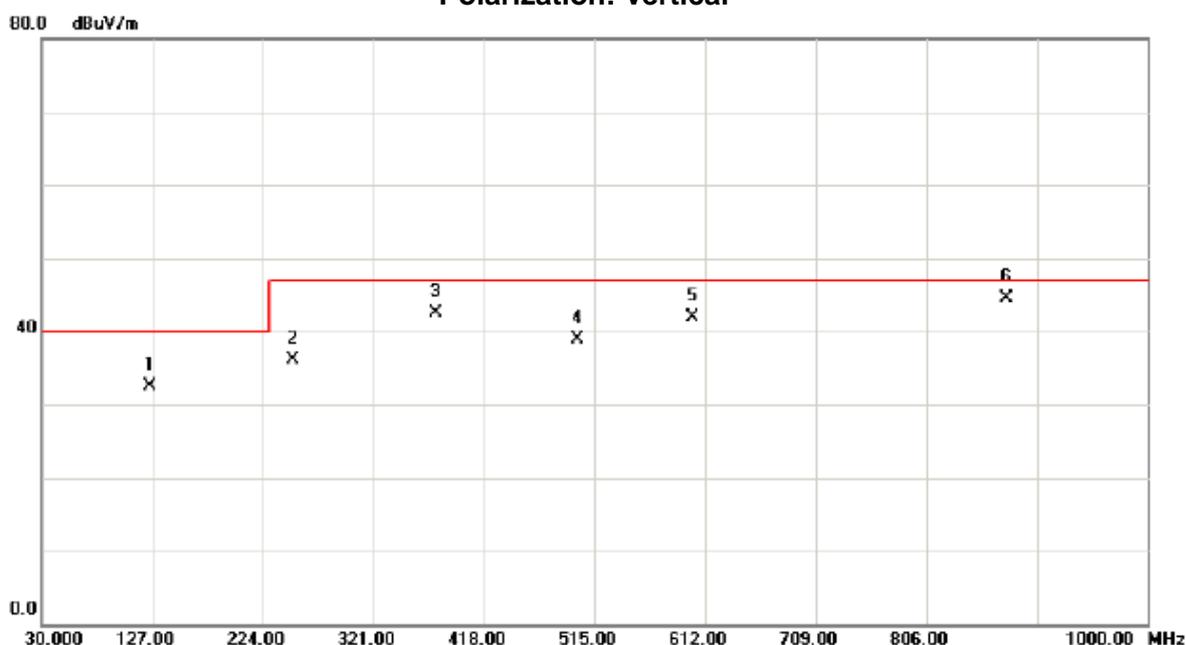
4.3.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

4.3.7 TEST RESULTS-BELOW 1 GHZ

| | | | |
|--------------|---|-------------------|----------|
| EUT | Network Video Recorder | Model Name | SVR-2104 |
| Temperature | 27 °C | Relative Humidity | 59% |
| Test Voltage | AC 230V/50Hz | | |
| Test Mode | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) | | |

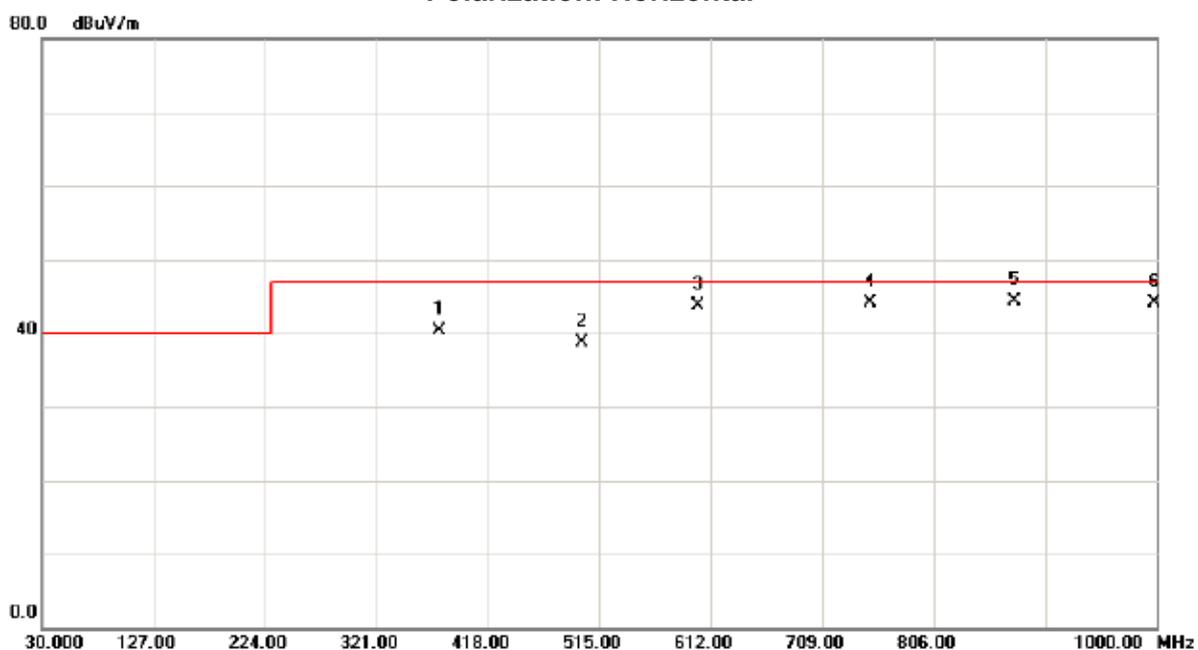
Polarization: Vertical



| No. Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Antenna Height cm | Table Degree | Comment |
|---------|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|-------------------------|-----------------|---------|
| 1 | 125.0120 | 38.85 | -6.34 | 32.51 | 40.00 | -7.49 | QP | 100 | 153 | |
| 2 | 250.0080 | 41.30 | -5.21 | 36.09 | 47.00 | -10.91 | QP | 100 | 265 | |
| 3 | 375.0130 | 44.71 | -2.13 | 42.58 | 47.00 | -4.42 | QP | 100 | 102 | |
| 4 | 500.0250 | 37.86 | 1.13 | 38.99 | 47.00 | -8.01 | QP | 125 | 164 | |
| 5 | 600.0020 | 38.12 | 3.87 | 41.99 | 47.00 | -5.01 | QP | 180 | 0 | |
| 6 * | 875.0000 | 34.33 | 10.13 | 44.46 | 47.00 | -2.54 | QP | 240 | 331 | |

| | | | |
|--------------|---|-------------------|----------|
| EUT | Network Video Recorder | Model Name | SVR-2104 |
| Temperature | 27 °C | Relative Humidity | 59% |
| Test Voltage | AC 230V/50Hz | | |
| Test Mode | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) | | |

Polarization: Horizontal

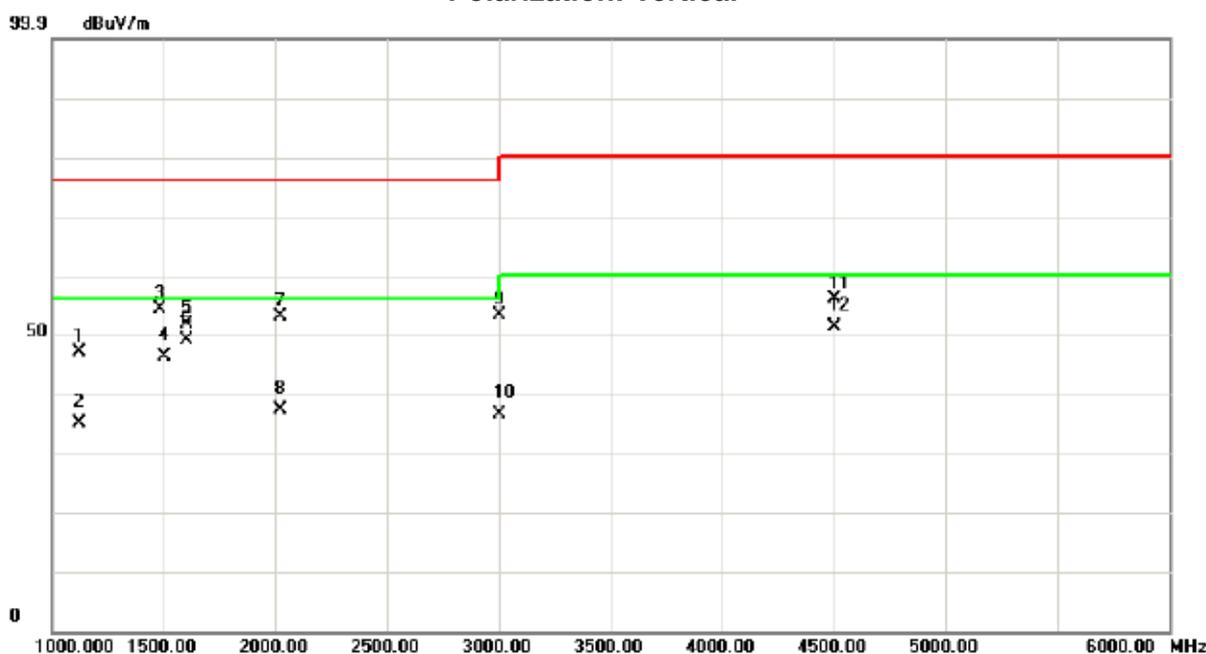


| No. Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Detector | Antenna Height cm | Table Degree | Comment |
|---------|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|----------|-------------------------|-----------------|---------|
| 1 | 375.0200 | 42.37 | -2.13 | 40.24 | 47.00 | -6.76 | QP | 303 | 105 | |
| 2 | 500.0340 | 37.60 | 1.13 | 38.73 | 47.00 | -8.27 | QP | 235 | 70 | |
| 3 | 600.0530 | 39.87 | 3.87 | 43.74 | 47.00 | -3.26 | QP | 182 | 37 | |
| 4 | 750.0130 | 36.00 | 8.05 | 44.05 | 47.00 | -2.95 | QP | 130 | 261 | |
| 5 * | 875.0010 | 34.12 | 10.13 | 44.25 | 47.00 | -2.75 | QP | 100 | 140 | |
| 6 | 999.9980 | 33.43 | 10.60 | 44.03 | 47.00 | -2.97 | QP | 100 | 141 | |

4.3.8 TEST RESULTS-ABOVE 1 GHZ

| | | | |
|--------------|---|-------------------|----------|
| EUT | Network Video Recorder | Model Name | SVR-2104 |
| Temperature | 21 °C | Relative Humidity | 62% |
| Test Voltage | AC 230V/50Hz | | |
| Test Mode | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) | | |

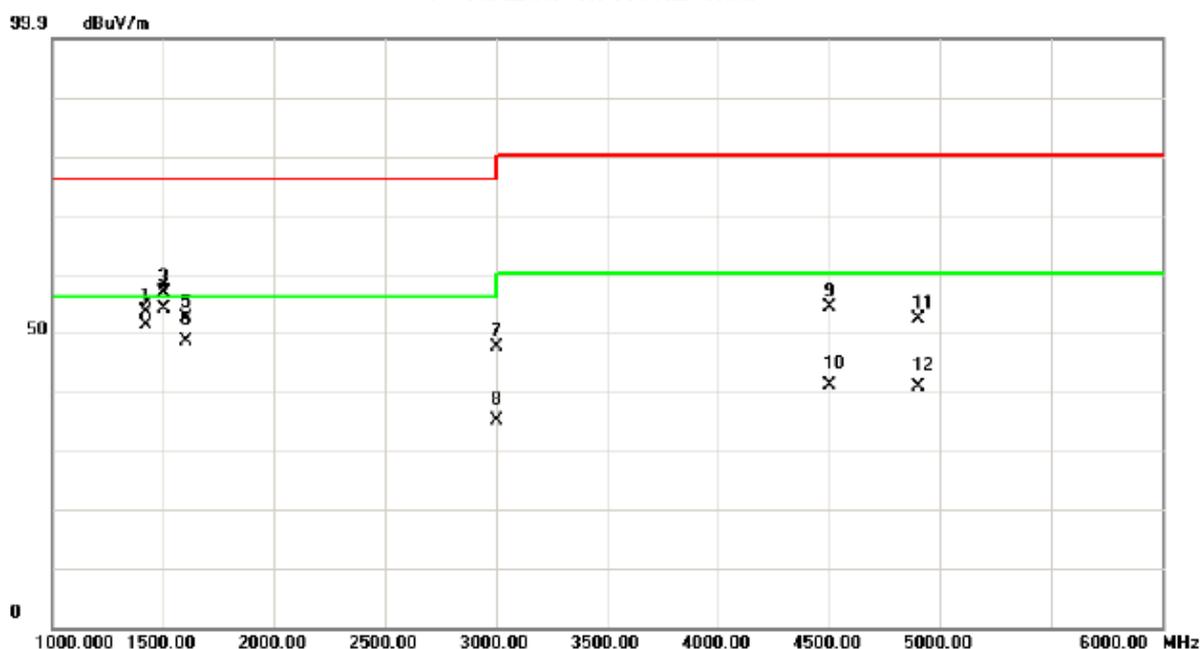
Polarization: Vertical



| No. | Mk. | Freq. | Reading Level | Correct Factor | Measurement | Limit | Over | Antenna Height | Table Degree | |
|-----|-----|----------|---------------|----------------|-------------|--------|--------|----------------|--------------|---------|
| | | MHz | dBuV | dB | dBuV/m | dBuV/m | dB | cm | degree | Comment |
| 1 | | 1125.000 | 52.67 | -5.75 | 46.92 | 76.00 | -29.08 | peak | 100 | 180 |
| 2 | | 1125.000 | 40.73 | -5.75 | 34.98 | 56.00 | -21.02 | AVG | 100 | 180 |
| 3 | | 1484.900 | 58.26 | -3.93 | 54.33 | 76.00 | -21.67 | peak | 114 | 200 |
| 4 | | 1484.900 | 50.17 | -3.93 | 46.24 | 56.00 | -9.76 | AVG | 114 | 200 |
| 5 | | 1600.000 | 55.56 | -3.77 | 51.79 | 76.00 | -24.21 | peak | 112 | 220 |
| 6 | * | 1600.000 | 52.79 | -3.77 | 49.02 | 56.00 | -6.98 | AVG | 112 | 220 |
| 7 | | 2025.000 | 54.55 | -1.62 | 52.93 | 76.00 | -23.07 | peak | 100 | 187 |
| 8 | | 2025.000 | 38.94 | -1.62 | 37.32 | 56.00 | -18.68 | AVG | 100 | 187 |
| 9 | | 3000.000 | 52.28 | 0.98 | 53.26 | 76.00 | -22.74 | peak | 112 | 223 |
| 10 | | 3000.000 | 35.46 | 0.98 | 36.44 | 56.00 | -19.56 | AVG | 112 | 223 |
| 11 | | 4500.000 | 48.90 | 7.14 | 56.04 | 80.00 | -23.96 | peak | 110 | 3 |
| 12 | | 4500.000 | 44.11 | 7.14 | 51.25 | 60.00 | -8.75 | AVG | 110 | 3 |

| | | | |
|--------------|---|-------------------|----------|
| EUT | Network Video Recorder | Model Name | SVR-2104 |
| Temperature | 21 °C | Relative Humidity | 62% |
| Test Voltage | AC 230V/50Hz | | |
| Test Mode | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) | | |

Polarization: Horizontal



| No. | Mk. | Freq. MHz | Reading Level dBuV | Correct Factor dB | Measure- ment dBuV/m | Limit dBuV/m | Over dB | Antenna Height cm | Table Degree | Comment |
|-----|-----|--------------|--------------------------|-------------------------|----------------------------|-----------------|------------|-------------------------|-----------------|---------|
| 1 | | 1425.000 | 57.41 | -3.97 | 53.44 | 76.00 | -22.56 | peak | 122 | 222 |
| 2 | | 1425.000 | 55.13 | -3.97 | 51.16 | 56.00 | -4.84 | AVG | 122 | 222 |
| 3 | | 1500.000 | 60.72 | -3.92 | 56.80 | 76.00 | -19.20 | peak | 102 | 23 |
| 4 | * | 1500.000 | 57.88 | -3.92 | 53.96 | 56.00 | -2.04 | AVG | 102 | 23 |
| 5 | | 1600.000 | 56.20 | -3.77 | 52.43 | 76.00 | -23.57 | peak | 100 | 100 |
| 6 | | 1600.000 | 52.20 | -3.77 | 48.43 | 56.00 | -7.57 | AVG | 100 | 100 |
| 7 | | 3000.000 | 46.66 | 0.98 | 47.64 | 76.00 | -28.36 | peak | 122 | 255 |
| 8 | | 3000.000 | 34.15 | 0.98 | 35.13 | 56.00 | -20.87 | AVG | 122 | 255 |
| 9 | | 4500.000 | 47.10 | 7.14 | 54.24 | 80.00 | -25.76 | peak | 104 | 360 |
| 10 | | 4500.000 | 33.81 | 7.14 | 40.95 | 60.00 | -19.05 | AVG | 104 | 360 |
| 11 | | 4900.000 | 45.12 | 7.24 | 52.36 | 80.00 | -27.64 | peak | 100 | 12 |
| 12 | | 4900.000 | 33.62 | 7.24 | 40.86 | 60.00 | -19.14 | AVG | 100 | 12 |

4.4 HARMONIC CURRENT EMISSIONS TEST

4.4.1 LIMITS

| EN 61000-3-2/IEC 61000-3-2 | | | | | | |
|----------------------------|---------------------|--|--------------------|---------------------|--|--------|
| Equipment Category | Harmonic Order n | Max. Permissible Harmonic Current A | Equipment Category | Harmonic Order n | Max. Permissible Harmonic Current A mA/w | |
| Class A | Odd Harmonics | | Class D | Odd Harmonics only | | |
| | 3 | 2.30 | | 3 | 2.30 | 3.4 |
| | 5 | 1.14 | | 5 | 1.14 | 1.9 |
| | 7 | 0.77 | | 7 | 0.77 | 1.0 |
| | 9 | 0.40 | | 9 | 0.40 | 0.5 |
| | 11 | 0.33 | | 11 | 0.33 | 0.35 |
| | 13 | 0.21 | | 13 | 0.21 | 0.30 |
| | 15≤n≤39 | 0.15 x 15/n | | 15≤n≤39 | 0.15 x 15/n | 3.85/n |
| | Even Harmonics | | | | | |
| | 2 | 1.08 | | | | |
| | 4 | 0.43 | | | | |
| | 6 | 0.30 | | | | |
| | 8≤n≤40 | 0.23 x 8/n | | | | |

4.4.2 MEASUREMENT INSTRUMENTS LIST

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|----------------------|--------------|-------------------------------|------------|------------------|
| 1 | Harmonic & Flicker | California | PACS-1 | 72345 | Apr. 23, 2016 |
| 2 | Power Source | California | 3001iX | 56310 | Apr. 23, 2016 |
| 3 | Measurement Software | California | CTS 3.0 (Version 3.2.0.31) | CIC632 | N/A |

Remark: "N/A" denotes No Model Name, No Serial No. or No Calibration specified.

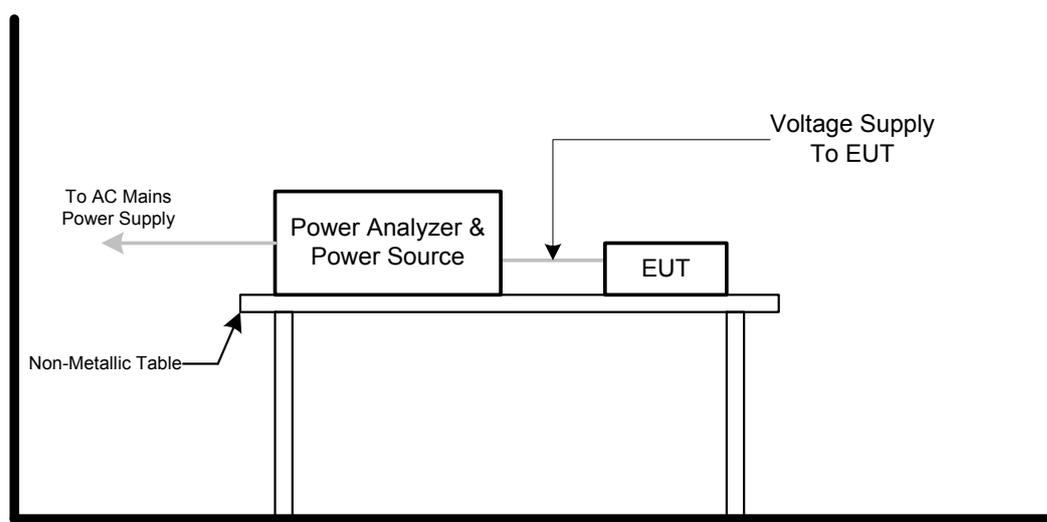
4.4.3 TEST PROCEDURE

- a. The EUT was placed on the top of a wooden table 0.8 meters above the ground and operated to produce the maximum harmonic components under normal operating conditions.
- b. The classification of EUT is according to of EN 61000-3-2/IEC 61000-3-2. The EUT is classified as follows:
 - Class A: Balanced three-phase equipment, Household appliances excluding equipment as Class D, Tools excluding portable tools, Dimmers for incandescent lamps, audio equipment, equipment not specified in one of the three other classes.
 - Class B: Portable tools; Arc welding equipment which is not professional equipment.
 - Class C: Lighting equipment.
 - Class D: Equipment having a specified power less than or equal to 600 W of the following types: Personal computers and personal computer monitors and television receivers.
- c. The correspondent test program of test instrument to measure the current harmonics emanated from EUT is chosen. The measure time shall be not less than the time necessary for the EUT to be exercised.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



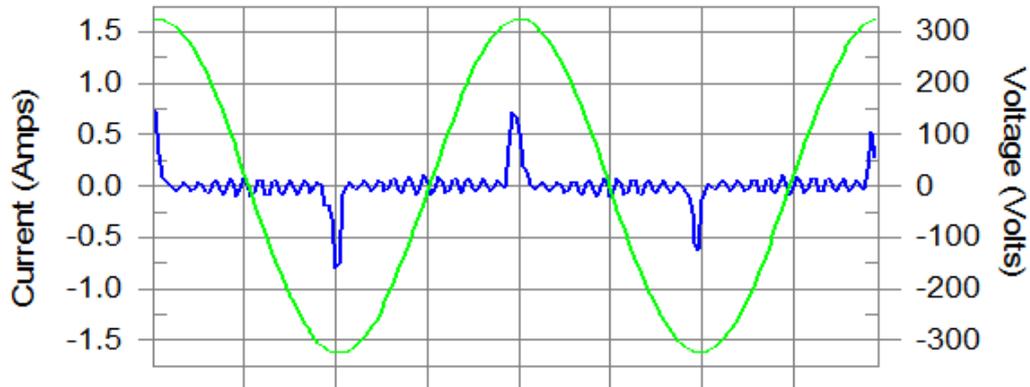
4.4.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

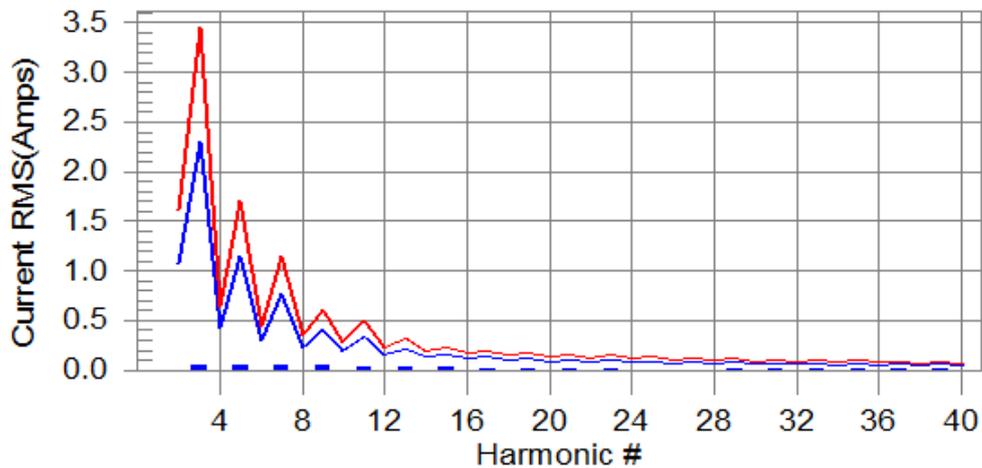
4.4.7 TEST RESULTS

| Harmonics – Class-A per Ed. 3.2 (2009) (Run time) incl. inter-harmonics | | | |
|---|---|-------------------|----------|
| EUT | Network Video Recorder | Model Name | SVR-2104 |
| Temperature | 26 °C | Relative Humidity | 45% |
| Test Voltage | AC 230V/50Hz | | |
| Test Mode | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) | | |

Current & voltage waveforms



Harmonics and Class A limit line European Limits



Test result: Pass Worst harmonic was #15 with 15.52% of the limit.

Current Test Result Summary (Run time)

| | | | |
|--------------|---|-------------------|----------|
| EUT | Network Video Recorder | Model Name | SVR-2104 |
| Temperature | 26 °C | Relative Humidity | 45% |
| Test Voltage | AC 230V/50Hz | | |
| Test Mode: | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) | | |

THC(A): 0.11 I-THD(%): 205.35 POHC(A): 0.012 POHC Limit(A): 0.251

Highest parameter values during test:

| | |
|----------------------------------|--------------------------------|
| V _{RMS} (Volts): 230.02 | Frequency(Hz): 50.00 |
| I _{Peak} (Amps): 1.038 | I _{RMS} (Amps): 0.148 |
| I _{Fund} (Amps): 0.054 | Crest Factor: 7.047 |
| Power (Watts): 12.2 | Power Factor: 0.386 |

| Harm# | Harms(avg) | 100%Limit | %of Limit | Harms(max) | 150%Limit | %of Limit | Status |
|-------|------------|-----------|-----------|------------|-----------|-----------|--------|
| 2 | 0.003 | 1.080 | 0.3 | 0.003 | 1.620 | 0.19 | Pass |
| 3 | 0.051 | 2.300 | 2.2 | 0.052 | 3.450 | 1.50 | Pass |
| 4 | 0.003 | 0.430 | 0.6 | 0.003 | 0.645 | 0.47 | Pass |
| 5 | 0.049 | 1.140 | 4.3 | 0.049 | 1.710 | 2.86 | Pass |
| 6 | 0.003 | 0.300 | 0.9 | 0.003 | 0.450 | 0.67 | Pass |
| 7 | 0.045 | 0.770 | 5.8 | 0.045 | 1.155 | 3.90 | Pass |
| 8 | 0.003 | 0.230 | 1.2 | 0.003 | 0.345 | 0.84 | Pass |
| 9 | 0.040 | 0.400 | 10.0 | 0.040 | 0.600 | 6.72 | Pass |
| 10 | 0.003 | 0.184 | 1.4 | 0.003 | 0.276 | 1.03 | Pass |
| 11 | 0.035 | 0.330 | 10.5 | 0.035 | 0.495 | 7.06 | Pass |
| 12 | 0.003 | 0.153 | 1.7 | 0.003 | 0.230 | 1.20 | Pass |
| 13 | 0.029 | 0.210 | 13.8 | 0.029 | 0.315 | 9.28 | Pass |
| 14 | 0.002 | 0.131 | 1.8 | 0.003 | 0.197 | 1.31 | Pass |
| 15 | 0.023 | 0.150 | 15.5 | 0.024 | 0.225 | 10.45 | Pass |
| 16 | 0.002 | 0.115 | 2.0 | 0.002 | 0.173 | 1.39 | Pass |
| 17 | 0.018 | 0.132 | 13.5 | 0.018 | 0.199 | 9.06 | Pass |
| 18 | 0.002 | 0.102 | 2.0 | 0.002 | 0.153 | 1.47 | Pass |
| 19 | 0.013 | 0.118 | 10.9 | 0.013 | 0.178 | 7.34 | Pass |
| 20 | 0.002 | 0.092 | 2.1 | 0.002 | 0.138 | 1.55 | Pass |
| 21 | 0.009 | 0.107 | 8.0 | 0.009 | 0.161 | 5.44 | Pass |
| 22 | 0.002 | 0.084 | 2.2 | 0.002 | 0.125 | 1.65 | Pass |
| 23 | 0.005 | 0.098 | 5.3 | 0.005 | 0.147 | 3.65 | Pass |
| 24 | 0.002 | 0.077 | 2.4 | 0.002 | 0.115 | 1.75 | Pass |
| 25 | 0.003 | 0.090 | 3.2 | 0.003 | 0.135 | 2.30 | Pass |
| 26 | 0.002 | 0.071 | 2.5 | 0.002 | 0.106 | 1.85 | Pass |
| 27 | 0.002 | 0.083 | 2.9 | 0.003 | 0.125 | 2.12 | Pass |
| 28 | 0.002 | 0.066 | 2.6 | 0.002 | 0.099 | 1.93 | Pass |
| 29 | 0.003 | 0.078 | 4.1 | 0.003 | 0.116 | 2.88 | Pass |
| 30 | 0.002 | 0.061 | 3.2 | 0.002 | 0.092 | 2.39 | Pass |
| 31 | 0.004 | 0.073 | 5.4 | 0.004 | 0.109 | 3.71 | Pass |
| 32 | 0.002 | 0.058 | 2.7 | 0.002 | 0.086 | 2.08 | Pass |
| 33 | 0.004 | 0.068 | 6.5 | 0.005 | 0.102 | 4.45 | Pass |
| 34 | 0.002 | 0.054 | 2.9 | 0.002 | 0.081 | 2.25 | Pass |
| 35 | 0.005 | 0.064 | 7.4 | 0.005 | 0.096 | 5.07 | Pass |
| 36 | 0.001 | 0.051 | 2.9 | 0.002 | 0.077 | 2.16 | Pass |
| 37 | 0.005 | 0.061 | 8.2 | 0.005 | 0.091 | 5.59 | Pass |
| 38 | 0.001 | 0.048 | 2.9 | 0.002 | 0.073 | 2.14 | Pass |
| 39 | 0.005 | 0.058 | 8.9 | 0.005 | 0.087 | 6.03 | Pass |
| 40 | 0.001 | 0.046 | 2.4 | 0.001 | 0.069 | 1.79 | Pass |

Voltage Source Verification Data (Run time)

| | | | |
|--------------|---|-------------------|----------|
| EUT | Network Video Recorder | Model Name | SVR-2104 |
| Temperature | 26 °C | Relative Humidity | 45% |
| Test Voltage | AC 230V/50Hz | | |
| Test Mode: | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) | | |

Highest parameter values during test:

| | |
|------------------------|----------------------|
| Voltage (Vrms): 230.02 | Frequency(Hz): 50.00 |
| I Peak (Amps): 1.038 | I RMS (Amps): 0.148 |
| I Fund (Amps): 0.054 | Crest Factor: 7.047 |
| Power (Watts): 12.2 | Power Factor: 0.386 |

| Harm# | Harmonics V-rms | Limit V-rms | % of Limit | Status |
|-------|-----------------|-------------|------------|--------|
| 2 | 0.093 | 0.460 | 20.15 | OK |
| 3 | 0.470 | 2.070 | 22.72 | OK |
| 4 | 0.025 | 0.460 | 5.38 | OK |
| 5 | 0.042 | 0.920 | 4.55 | OK |
| 6 | 0.026 | 0.460 | 5.58 | OK |
| 7 | 0.020 | 0.690 | 2.95 | OK |
| 8 | 0.015 | 0.460 | 3.33 | OK |
| 9 | 0.040 | 0.460 | 8.65 | OK |
| 10 | 0.015 | 0.460 | 3.22 | OK |
| 11 | 0.027 | 0.230 | 11.79 | OK |
| 12 | 0.017 | 0.230 | 7.27 | OK |
| 13 | 0.032 | 0.230 | 14.11 | OK |
| 14 | 0.007 | 0.230 | 2.84 | OK |
| 15 | 0.023 | 0.230 | 9.92 | OK |
| 16 | 0.012 | 0.230 | 5.10 | OK |
| 17 | 0.019 | 0.230 | 8.06 | OK |
| 18 | 0.016 | 0.230 | 7.17 | OK |
| 19 | 0.020 | 0.230 | 8.66 | OK |
| 20 | 0.017 | 0.230 | 7.33 | OK |
| 21 | 0.011 | 0.230 | 4.68 | OK |
| 22 | 0.012 | 0.230 | 5.19 | OK |
| 23 | 0.014 | 0.230 | 5.99 | OK |
| 24 | 0.009 | 0.230 | 3.72 | OK |
| 25 | 0.006 | 0.230 | 2.58 | OK |
| 26 | 0.006 | 0.230 | 2.81 | OK |
| 27 | 0.008 | 0.230 | 3.68 | OK |
| 28 | 0.008 | 0.230 | 3.44 | OK |
| 29 | 0.006 | 0.230 | 2.75 | OK |
| 30 | 0.006 | 0.230 | 2.62 | OK |
| 31 | 0.003 | 0.230 | 1.52 | OK |
| 32 | 0.008 | 0.230 | 3.28 | OK |
| 33 | 0.008 | 0.230 | 3.38 | OK |
| 34 | 0.003 | 0.230 | 1.12 | OK |
| 35 | 0.006 | 0.230 | 2.59 | OK |
| 36 | 0.005 | 0.230 | 2.13 | OK |
| 37 | 0.008 | 0.230 | 3.49 | OK |
| 38 | 0.002 | 0.230 | 0.96 | OK |
| 39 | 0.005 | 0.230 | 2.37 | OK |
| 40 | 0.007 | 0.230 | 2.93 | OK |

4.5 VOLTAGE CHANGES, VOLTAGE FLUCTUATIONS AND FLICKER TEST

4.5.1 LIMITS

| Tests | Limits | | Descriptions |
|-------|--------------------|---------------------|----------------------------------|
| | IEC555-3 | IEC/EN 61000-3-3 | |
| Pst | ≤ 1.0, Tp= 10 min. | ≤ 1.0, Tp= 10 min. | Short Term Flicker Indicator |
| Plt | N/A | ≤ 0.65, Tp=2 hr. | Long Term Flicker Indicator |
| dc | ≤ 3 % | ≤ 3.3 % | Relative Steady-State V-Chang |
| dmax | ≤ 4 % | ≤ 4 % | Maximum Relative V-change |
| d (t) | N/A | ≤ 3.3% for > 500 ms | Relative V-change characteristic |

4.5.2 MEASUREMENT INSTRUMENTS LIST

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|----------------------|--------------|-------------------------------|------------|------------------|
| 1 | Harmonic & Flicker | California | PACS-1 | 72345 | Apr. 23, 2016 |
| 2 | Power Source | California | 3001iX | 56310 | Apr. 23, 2016 |
| 3 | Measurement Software | California | CTS 3.0 (Version 3.2.0.31) | CIC632 | N/A |

Remark: "N/A" denotes No Model Name, No Serial No. or No Calibration specified.

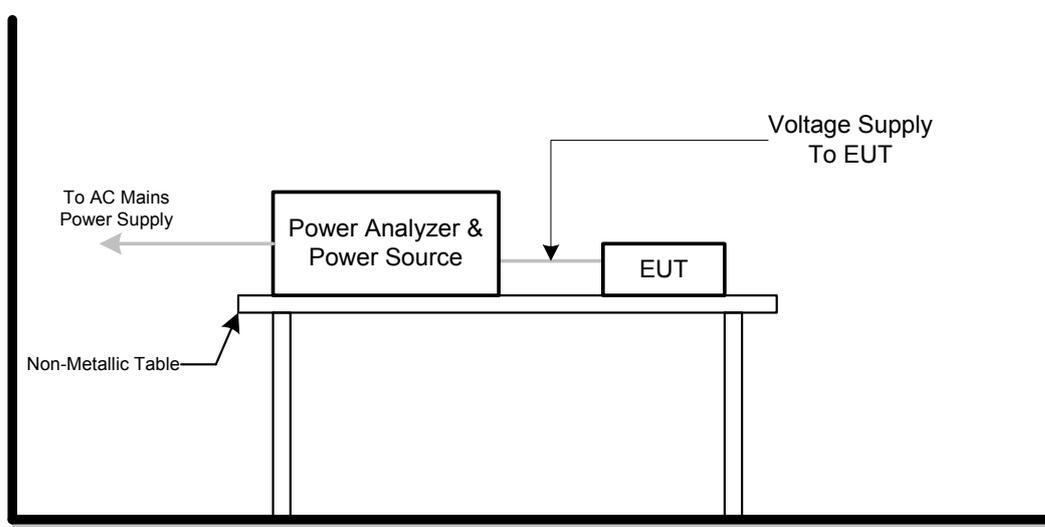
4.5.3 TEST PROCEDURE

- a. Tests was performed according to the Test Conditions/Assessment of Voltage Fluctuations specified in EN 61000-3-3/IEC 61000-3-3 depend on which standard adopted for compliance measurement.
- b. All types of harmonic current and/or voltage fluctuation in this report are assessed by direct measurement using flicker-meter.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TESTSETUP



4.5.6 EUT OPERATING CONDITIONS

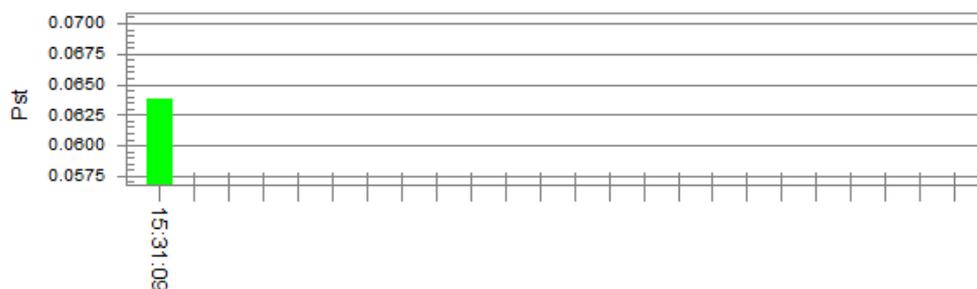
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

4.5.7 TEST RESULTS

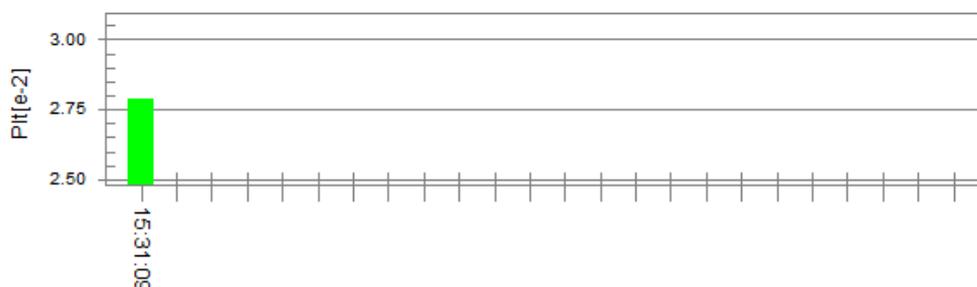
| | | | |
|--------------|---|-------------------|----------|
| EUT | Network Video Recorder | Model Name | SVR-2104 |
| Temperature | 26 °C | Relative Humidity | 45% |
| Test Voltage | AC 230V/50Hz | | |
| Test Mode | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) | | |

Pst_t and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

| | | | |
|---------------------------------|--------|------------------|------------|
| Vrms at the end of test (Volt): | 229.96 | | |
| Highest dt (%): | 0.00 | Test limit (%): | 3.30 Pass |
| Time(mS) > dt: | 0.0 | Test limit (mS): | 500.0 Pass |
| Highest dc (%): | 0.00 | Test limit (%): | 3.30 Pass |
| Highest dmax (%): | 0.00 | Test limit (%): | 4.00 Pass |

5. EMC IMMUNITY TEST

5.1 STANDARD COMPLIANCE/SERVIRITY LEVEL/CRITERIA

| Tests Standard No. | TEST SPECIFICATION Level | Test Mode Test Ports | Criterion |
|---|---|-------------------------------------|-----------|
| Electrostatic discharge immunity IEC/EN 61000-4-2 | ±8 kV air discharge ±4 kV contact discharge | Direct Mode | B |
| | ±4 kV HCP discharge ±4 kV VCP discharge | Indirect Mode | B |
| Radiated, radio-frequency, electromagnetic field immunity IEC/EN 61000-4-3 | 80 MHz to 1000 MHz 3 V/m(rms), 1 kHz, 80%, AM modulated | Enclosure | A |
| Electrical fast transient/burst immunity IEC/EN 61000-4-4 | ±1.0kV(peak) 5/50ns Tr/Th 5 kHz Repetition Freq. | Power Supply Port | B |
| | ±0.5 kV(peak) 5/50ns Tr/Th 5 kHz Repetition Freq. | CTL/Signal Data Line Port | B |
| Surge immunity IEC/EN 61000-4-5 | ±1 kV(5P/5N) 1.2/50(8/20) Tr/Th µs | AC Power Port L-N | B |
| | ±2 kV(5P/5N) 1.2/50(8/20) Tr/Th µs | AC Power Port L-PE/N-PE | B |
| | ±1 kV(5P/5N) 1.2/50(8/20) Tr/Th µs | DC Power Port | B |
| | ±1 kV(5P/5N) 10/700 or 1.2/50 Tr/Th µs | Signal/Telecommuni- cation Ports | C |
| Immunity to conducted disturbances, induced by radio-frequency fields IEC/EN 61000-4-6 | 0.15 MHz to 80 MHz 3 V(rms), 1 kHz 80%, AM Modulated 150Ω source impedance | CTL/Signal Port | A |
| | 0.15 MHz to 80 MHz 3 V(rms), 1 kHz 80%, AM Modulated 150Ω source impedance | AC Power Port | A |
| | 0.15 MHz to 80 MHz 3 V(rms), 1 kHz 80%, AM Modulated 150Ω source impedance | DC Power Port | A |
| Power frequency magnetic field immunity IEC/EN 61000-4-8 | 50/60 Hz, 1 A/m | Enclosure | A |
| Voltage dips, short interruptions and voltage variations immunity IEC/EN 61000-4-11 | Voltage Dips > 95% | | B |
| | Voltage Dips 30% | AC Power Port | C |
| | Voltage Interruptions > 95% | | C |

5.2 GENERAL PERFORMANCE CRITERIA

According to **EN55024** standard, the general performance criteria as following:

| | |
|--------------------|--|
| Criterion A | <p>The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.</p> <p>If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.</p> |
| Criterion B | <p>After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomenon below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.</p> <p>During the test, degradation of performance is allowed. However, no change of operating state if stored data allowed to persist after the test. If the minimum performance level (or the permissible performance loss) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.</p> |
| Criterion C | <p>Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.</p> <p>Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.</p> |

5.3 GENERAL PERFORMANCE CRITERIA TEST SETUP

The EUT tested system was configured as the statements of **4.1.6** Unless otherwise a special operating condition is specified in the follows during the testing.

5.4 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

5.4.1 TEST SPECIFICATION

| | |
|----------------------|---|
| Basic Standard | IEC/EN 61000-4-2 |
| Discharge Impedance | 330 ohm / 150 pF |
| Required Performance | B |
| Discharge Voltage | Air Discharge: ± 2 kV, ± 4 kV, ± 8 kV (Direct) Contact Discharge: ± 2 kV, ± 4 kV (Direct/Indirect) |
| Polarity | Positive & Negative |
| Number of Discharge | Air Discharge: min. 20 times at each test point Contact Discharge: min. 200 times in total |
| Discharge Mode | Single Discharge |
| Discharge Period | 1 second minimum |

5.4.2 MEASUREMENT INSTRUMENTS

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|-------------------|--------------|----------|------------|------------------|
| 1 | ESD Simulator | Thermo | MZ-15/EC | 0502184 | Oct. 24, 2015 |

Remark: "N/A" denotes No Model Name, No Serial No. or No Calibration specified.

5.4.3 TEST PROCEDURE

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

- a. Contact discharge was applied to conductive surfaces (Direct) and coupling planes (Indirect) of the EUT.

During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second. The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges.

If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.

Vertical Coupling Plane (VCP):

The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge.

Horizontal Coupling Plane (HCP):

The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge.

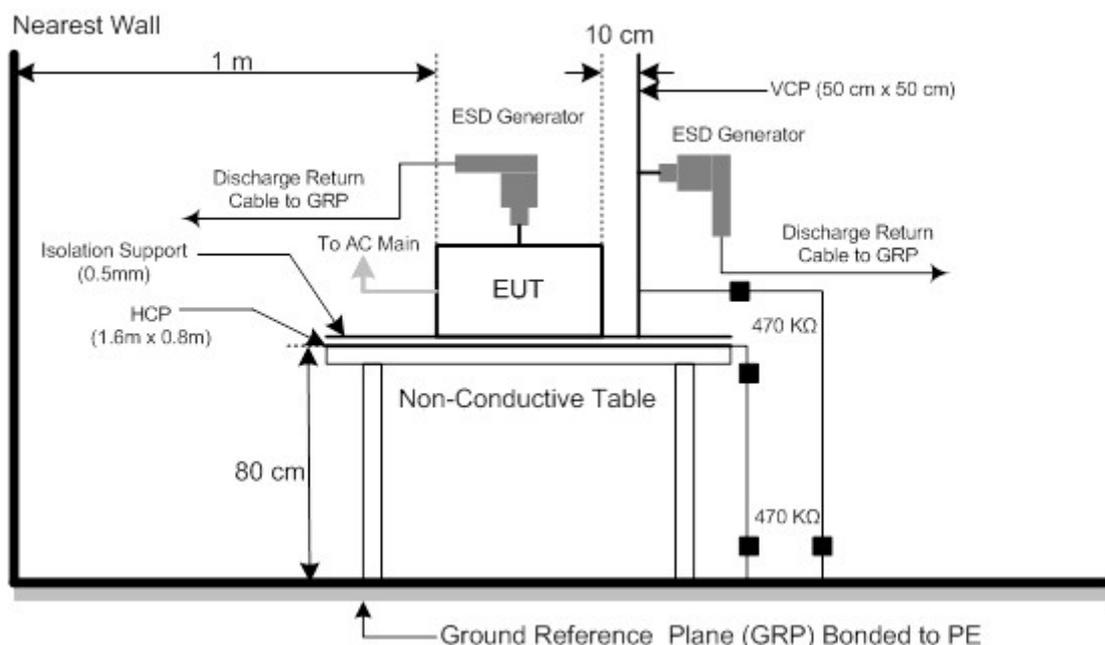
- b. Air discharges at insulation surfaces of the EUT.

It was at least ten single discharges with positive and negative at the same selected point.

5.4.4 DEVIATION FROM TEST STANDARD

No deviation

5.4.5 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test was installed in a representative system as described in EN 61000-4-2/ IEC 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of 1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in EN 61000-4-2/IEC 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

5.4.6 TEST RESULTS

| | | | |
|-------------|---|-------------------|--------------|
| EUT | Network Video Recorder | Model Name | SVR-2104 |
| Temperature | 23 °C | Relative Humidity | 46% |
| Pressure | 1012 hPa | Test Voltage | AC 230V/50Hz |
| Test Mode | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) | | |

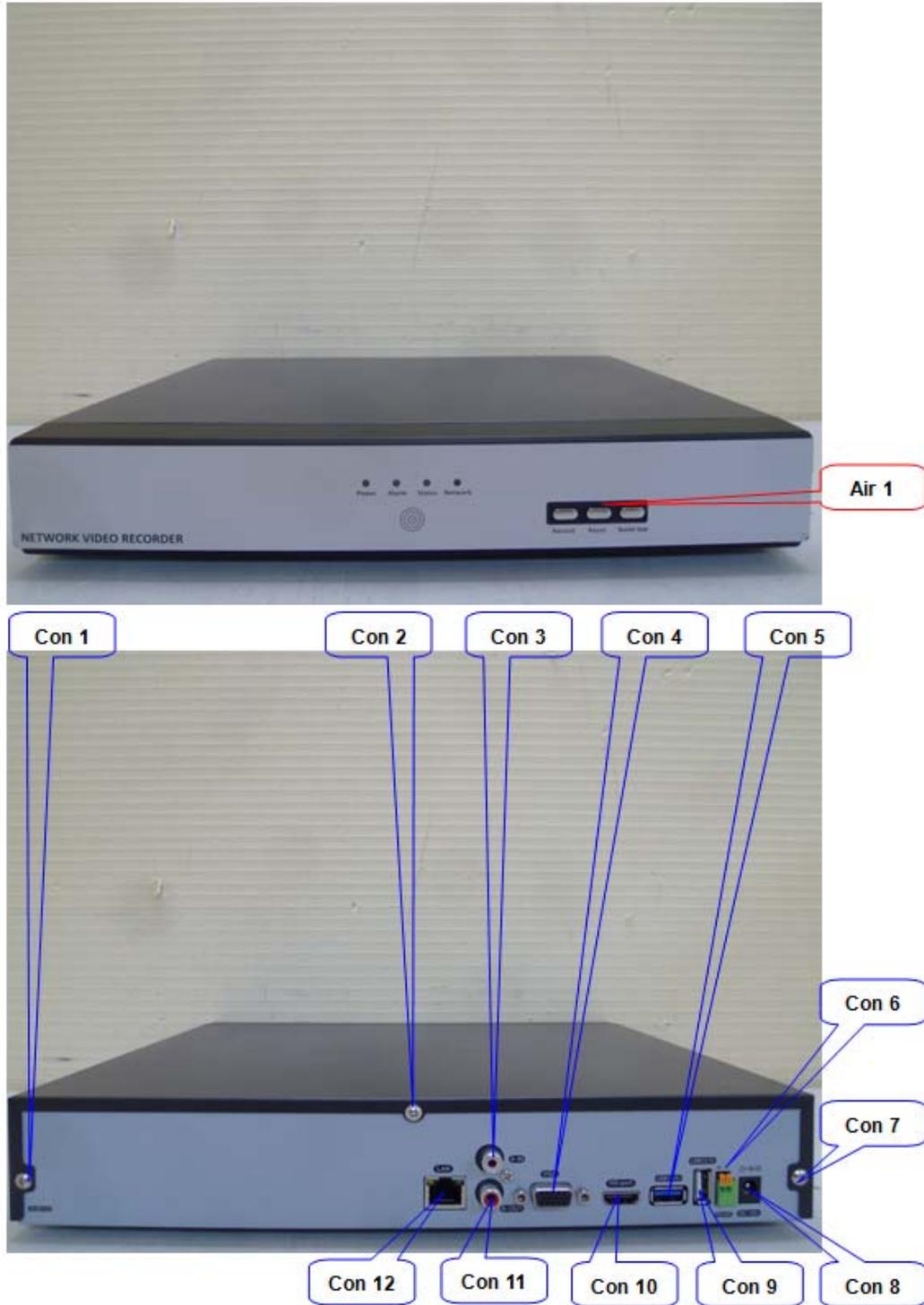
| Mode | Air Discharge | | | | | | | | Contact Discharge | | | | | | | |
|-----------|---------------|---|------|---|------|---|------|---|-------------------|---|------|---|------|---|------|---|
| | 2 kV | | 4 kV | | 8 kV | | - kV | | 2kV | | 4 kV | | - kV | | - kV | |
| Location | P | N | P | N | P | N | P | N | P | N | P | N | P | N | P | N |
| 1 | B | B | B | B | B | B | - | - | A | A | A | A | - | - | - | - |
| 2 | A | A | A | A | A | A | - | - | B | B | B | B | - | - | - | - |
| 3 | A | A | A | A | A | A | - | - | B | B | B | B | - | - | - | - |
| 4 | A | A | A | A | A | A | - | - | B | B | B | B | - | - | - | - |
| 5 | A | A | A | A | A | A | - | - | B | B | B | B | - | - | - | - |
| 6 | - | - | - | - | - | - | - | - | B | B | B | B | - | - | - | - |
| 7 | - | - | - | - | - | - | - | - | B | B | B | B | - | - | - | - |
| 8 | - | - | - | - | - | - | - | - | B | B | B | B | - | - | - | - |
| 9 | - | - | - | - | - | - | - | - | B | B | B | B | - | - | - | - |
| 10 | - | - | - | - | - | - | - | - | A | A | A | A | - | - | - | - |
| 11 | - | - | - | - | - | - | - | - | B | B | B | B | - | - | - | - |
| 12 | - | - | - | - | - | - | - | - | B | B | B | B | - | - | - | - |
| 13 | - | - | - | - | - | - | - | - | A | A | A | A | | | | |
| 14 | - | - | - | - | - | - | - | - | A | A | A | A | | | | |
| Criterion | B | | | | | | | | B | | | | | | | |
| Result | B | | | | | | | | B | | | | | | | |
| Judgment | PASS | | | | | | | | PASS | | | | | | | |

| Mode | HCP Discharge | | | | | | | | VCP Discharge | | | | | | | |
|-----------|---------------|---|------|---|------|---|------|---|---------------|---|------|---|------|---|------|---|
| | 2 kV | | 4 kV | | - kV | | - kV | | 2 kV | | 4 kV | | - kV | | - kV | |
| Location | P | N | P | N | P | N | P | N | P | N | P | N | P | N | P | N |
| 1 | A | A | A | A | - | - | - | - | A | A | A | A | - | - | - | - |
| 2 | A | A | A | A | - | - | - | - | A | A | A | A | - | - | - | - |
| 3 | A | A | A | A | - | - | - | - | A | A | A | A | - | - | - | - |
| 4 | A | A | A | A | - | - | - | - | A | A | A | A | - | - | - | - |
| Criterion | B | | | | | | | | B | | | | | | | |
| Result | A | | | | | | | | A | | | | | | | |
| Judgment | PASS | | | | | | | | PASS | | | | | | | |

Note:

- 1) P/N denotes the Positive/Negative polarity of the output voltage.
- 2) Test condition:
Direct/Indirect (HCP/VCP) discharges: Minimum 25 times (Positive/Negative) at each point.
Air discharges: Minimum 10 times (Positive/Negative) at each point.
- 3) Test location(s) in which discharge (Air and contact discharge) to be applied illustrated by photos shown in next page(s)
- 4) The Indirect (HCP/VCP) discharges description of test point as following:
1. left side; 2.right side; 3.front side; 4.rear side.
- 5) N/A - denotes test is not applicable in this test report
- 6) Criterion A: No observation of any performance degradation.
- 7) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 8) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.

PHOTO(S) SHOWN THE LOCATION(S) OF ESD EVALUATED



PHOTO(S) SHOWN THE LOCATION(S) OF ESD EVALUATED

PHOTO(S) SHOWN THE LOCATION(S) OF ESD EVALUATED

5.5 RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMUNITY TEST (RS)

5.5.1 TEST SPECIFICATION

| | |
|----------------------|-------------------------------------|
| Basic Standard | IEC/EN 61000-4-3 |
| Required Performance | A |
| Frequency Range | 80 MHz - 1000 MHz |
| Field Strength | 3 V/m |
| Modulation | 1 kHz Sine Wave, 80%, AM Modulation |
| Frequency Step | 1% of fundamental |
| Polarity of Antenna | Horizontal and Vertical |
| Test Distance | 3 m |
| Antenna Height | 1.5 m |
| Dwell Time | at least 3 seconds |

5.5.2 MEASUREMENT INSTRUMENTS

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|-------------------------|--------------|-----------------------|-----------------|------------------|
| 1 | Signal Generator | R&S | SMT06 | 832080/007 | Jun. 19, 2015 |
| 2 | Log-Periodic Antenna | AR | AT1080 | 320290 | N/A |
| 3 | Power Amplifier | AR | 150W1000M1 | 320946 | N/A |
| 4 | Laser Power Field Probe | AR | FL7004 | 0320284/0313298 | Oct. 09, 2015 |
| 5 | RF Power Meter | BOONTON | 4232A | 10179 | Aug. 30, 2015 |
| 6 | Power Sensor | BOONTON | 51011-EMC | 34150 | Aug. 30, 2015 |
| 7 | Measurement Software | AR | SW1006 (Version 1.22) | 321779 | N/A |

Remark: "N/A" denotes No Model Name, No Serial No. or No Calibration specified.

5.5.3 TEST PROCEDURE

The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.

The testing distance from antenna to the EUT was 3 meters.

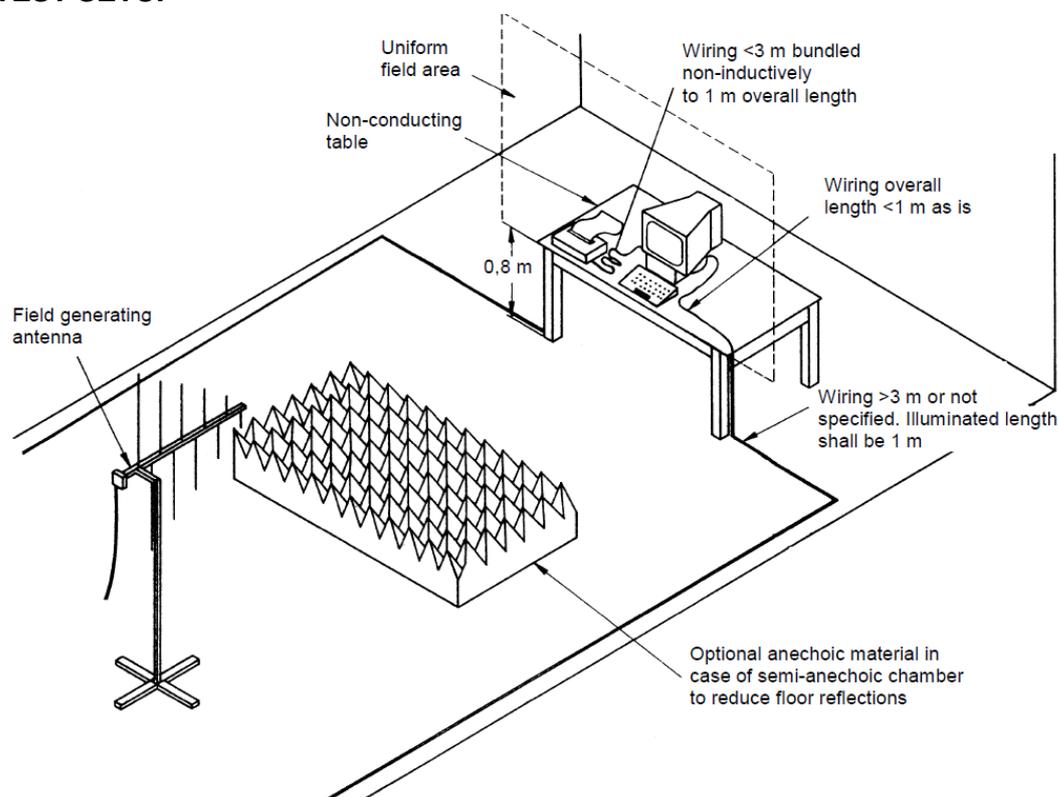
The other condition as following manner:

- a. The field strength level was 3 V/m.
- b. The frequency range is swept from 80 MHz to 1000 MHz, with the signal 80% amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5×10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- c. Sweep Frequency 900 MHz, with the Duty Cycle: 1/8 and Modulation: Pulse 217 Hz (if applicable)
- d. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- e. The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

5.5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5.5 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The EUT installed in a representative system as described in EN 61000-4-3/IEC 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in EN 61000-4-3/IEC 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

5.5.6 TEST RESULTS

| | | | |
|--------------|---|-------------------|----------|
| EUT | Network Video Recorder | Model Name | SVR-2104 |
| Temperature | 23°C | Relative Humidity | 46% |
| Test Voltage | AC 230V/50Hz | | |
| Test Mode | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) | | |

| Frequency Range (MHz) | RF Field Position | R.F. Field Strength | Azimuth | Criterion | Result | Judgment |
|-----------------------|-------------------|---|---------|-----------|----------|-------------|
| 80 - 1000 | H / V | 3 V/m (rms) AM Modulated 1 kHz, 80% | 0 | A | A | PASS |
| | | | 90 | | | |
| | | | 180 | | | |
| | | | 270 | | | |

Note:

- 1) P/N denotes the Positive/Negative polarity of the output voltage.
- 2) N/A - denotes test is not applicable in this test report.
- 3) Criterion A: No observation of any performance degradation.
- 4) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 5) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.

5.6 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (EFT/BURST)

5.6.1 TEST SPECIFICATION

| | |
|----------------------|---|
| Basic Standard | IEC/EN 61000-4-4 |
| Required Performance | B |
| Test Voltage | Power Line: ± 1 kV Signal/Control Line: ± 0.5 kV |
| Polarity | Positive & Negative |
| Impulse Frequency | 5 kHz: except for xDSL equipment 100 kHz: only for single lines of xDSL equipment. |
| Impulse Wave shape | 5/50 ns |
| Burst Duration | 15 ms |
| Burst Period | 300 ms |
| Test Duration | Not less than 1 min. |

5.6.2 MEASUREMENT INSTRUMENTS

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|--|--------------|------------------------|------------|------------------|
| 1 | EMC Immunity Test System | TESEQ | NSG 3060 | 1558 | Jan 26, 2016 |
| 2 | EMC Immunity Test System | TESEQ | CDN 3061 | 1452 | Jan 26, 2016 |
| 3 | Single motor driven variable transformer | TESEQ | VAR 3005-S16 | 844 | Jan 26, 2016 |
| 4 | Measurement Software | TESEQ | WIN 3000 (Version 1.2) | N/A | N/A |
| 5 | Capacitive Clamp | TESEQ | CDN 3425 | 1958 | Dec. 10,2015 |

Remark: "N/A" denotes No Model Name, No Serial No. or No Calibration specified.

5.6.3 TEST PROCEDURE

The EUT and support equipment(s) are placed on a table that is 0.8 meter high above a metal ground plane and should be located 0.1 m \pm 0.01m high above the Ground Reference Plane (1m*1m min. and 0.65mm thick min).

The other condition as following manner:

- The length of power cord between the coupling device and the EUT should not exceed 1 meter.
- Both positive and negative polarity discharges were applied.
- The duration time of each test sequential was 1 minute

5.6.4 DEVIATION FROM TEST STANDARD

No deviation

5.6.6 TEST RESULTS

| | | | |
|--------------|---|-------------------|----------|
| EUT | Network Video Recorder | Model Name | SVR-2104 |
| Temperature | 23°C | Relative Humidity | 46% |
| Test Voltage | AC 230V/50Hz | | |
| Test Mode | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) | | |

| EUT Ports Tested | | Polarity | Repetition Frequency | Test Level | Criterion | Result | Judgment |
|------------------|-------------|----------|----------------------|------------|-----------|----------|-------------|
| | | | | 1 kV | | | |
| AC Power Port | Line (L) | + | 5 kHz | A | B | A | PASS |
| | | - | 5 kHz | A | | | |
| | Neutral (N) | + | 5 kHz | A | B | A | |
| | | - | 5 kHz | A | | | |

| EUT Ports Tested | | Polarity | Repetition Frequency | Test Level | Criterion | Result | Judgment |
|------------------------------|-------|----------|----------------------|------------|-----------|----------|-------------|
| | | | | 0.5 kV | | | |
| Signal/Data/ Control Port | RJ-45 | + | 5 kHz | A | B | A | PASS |
| | | - | 5 kHz | A | | | |

Note:

- 1) N/A - denotes test is not applicable in this test report
- 2) Criterion A: No observation of any performance degradation.
- 3) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 4) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.

5.7 SURGE IMMUNITY TEST

5.7.1 TEST SPECIFICATION

| | |
|----------------------------|--|
| Basic Standard | IEC/EN 61000-4-5 |
| Required Performance | B (For Power Line) |
| Wave-Shape | Combination Wave for power lines 1.2/50 us Open Circuit Voltage 8 /20 us Short Circuit Current |
| Test Voltage | Power Line: ± 0.5 kV, ± 1 kV |
| Surge Input/Output | L-N |
| Generator Source Impedance | 2 ohm between networks |
| Polarity | Positive/Negative |
| Phase Angle | 0°/90°/180°/270° |
| Pulse Repetition Rate | 1 time / min. (maximum) |
| Number of Tests | 5 positive and 5 negative at selected points |

5.7.2 MEASUREMENT INSTRUMENTS

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|--|--------------|------------------------|------------|------------------|
| 1 | EMC Immunity Test System | TESEQ | NSG 3060 | 1558 | Jan 26, 2016 |
| 2 | EMC Immunity Test System | TESEQ | CDN 3061 | 1452 | Jan 26, 2016 |
| 3 | Single motor driven variable transformer | TESEQ | VAR 3005-S16 | 844 | Jan 26, 2016 |
| 4 | Measurement Software | TESEQ | WIN 3000 (Version 1.2) | N/A | N/A |

Remark: "N/A" denotes No Model Name, No Serial No. or No Calibration specified.

5.7.3 TEST PROCEDURE

a. For EUT power supply:

The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are 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. The power cord between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT:

The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

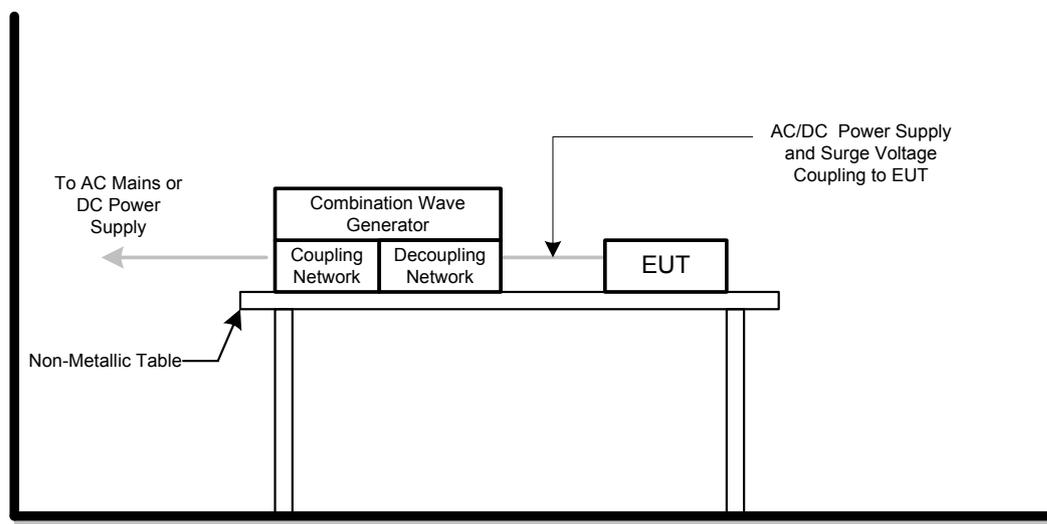
c. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT:

The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

5.7.4 DEVIATION FROM TEST STANDARD

No deviation

5.7.5 TEST SETUP



5.7.6 TEST RESULTS

| | | | |
|--------------|---|-------------------|----------|
| EUT | Network Video Recorder | Model Name | SVR-2104 |
| Temperature | 23°C | Relative Humidity | 46% |
| Test Voltage | AC 230V/50Hz | | |
| Test Mode | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) | | |

| Wave Form EUT Ports Tested | | 1.2/50(8/20)Tr/Th μ s | | | | | | Criterion | Result | Judgment |
|-------------------------------|------------------|---------------------------|-------|---------|------|------|------|-----------|----------|-------------|
| | | Polarity | Phase | Voltage | | | | | | |
| | | | | 0.5 kV | 1 kV | - kV | - kV | | | |
| AC | L – N (2 ohm) | +/- | 0° | A | A | - | - | B | A | PASS |
| | | +/- | 90° | A | A | - | - | | | |
| | | +/- | 180° | A | A | - | - | | | |
| | | +/- | 270° | A | A | - | - | | | |

Note:

- 1) Polarity and Numbers of Impulses : 5 Pst / Ngt at each tested mode
- 2) N/A - denotes test is not applicable in this Test Report
- 3) Criterion A: No observation of any performance degradation.
- 4) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 5) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.

5.8 IMMUNITY TO CONDUCTED DISTURBANCES, INDUCED BY RADIO-FREQUENCY FIELDS TEST (CS)

5.8.1 TEST SPECIFICATION

| | |
|----------------------|-------------------------------------|
| Basic Standard | IEC/EN 61000-4-6 |
| Required Performance | A |
| Frequency Range | 0.15 MHz - 80 MHz |
| Field Strength | 3 Vr.m.s. |
| Modulation | 1 kHz Sine Wave, 80%, AM Modulation |
| Frequency Step | 1% of fundamental |
| Dwell Time | at least 3 seconds |

5.8.2 MEASUREMENT INSTRUMENTS

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|---|--------------|--|------------|------------------|
| 1 | CDN (M2) | FCC | FCC-801-M2/M3-16A | 06043 | Jun. 24, 2015 |
| 2 | CDN | FCC | F-090407-1004-1 | 100520 | May. 19, 2016 |
| 3 | 50Ω BNC TYPE Terminator | N/A | N/A | 07 | Jul. 04, 2015 |
| 4 | Test System for Conducted and Radiated Immunity | TESEQ | NSG 4070 | 30593 | Mar. 24, 2016 |
| 5 | Measurement Software | TESEQ | NSG 4070 Control Program (Version 1.2) | N/A | N/A |

Remark: "N/A" denotes No Model Name, No Serial No. or No Calibration specified.

5.8.3 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min.

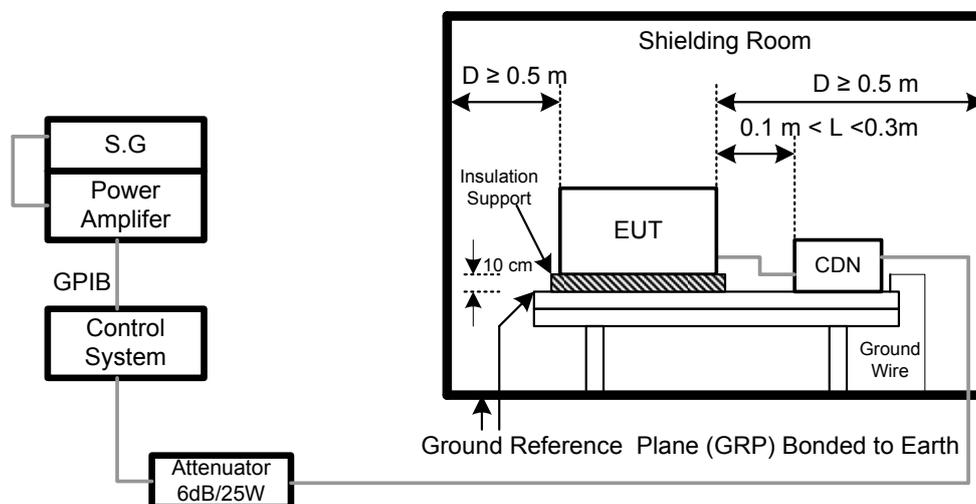
The other condition as following manner:

- a. The field strength level was 3 Vr.m.s..
- b. The frequency range is swept from 150 kHz to 80 MHz, with the signal 80%amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed 1.5×10^{-3} decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- c. The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

5.8.4 DEVIATION FROM TEST STANDARD

No deviation

5.8.5 TEST SETUP



NOTE:

FLOOR-STANDING EQUIPMENT

The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.

5.8.6 TEST RESULTS

| | | | |
|--------------|---|-------------------|----------|
| EUT | Network Video Recorder | Model Name | SVR-2104 |
| Temperature | 23°C | Relative Humidity | 46% |
| Test Voltage | AC 230V/50Hz | | |
| Test Mode | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) | | |

| Test Ports (Mode) | Freq. Range (MHz) | Field Strength | Criterion | Result | Judgment |
|------------------------------|-------------------|---|-----------|--------|----------|
| Input/ Output AC. Power Port | 0.15 - 80 | 3 Vr.m.s. AM Modulated 1 kHz, 80% | A | A | PASS |
| Input/ Output DC. Power Port | | | A | N/A | N/A |
| Signal Line (RJ-45) | | | A | A | PASS |

Note:

- 1) N/A - denotes test is not applicable in this Test Report.
- 2) Criterion A: No observation of any performance degradation.
- 3) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 4) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.

5.9 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST (PFMF)

5.9.1 TEST SPECIFICATION

| | |
|----------------------|-------------------------|
| Basic Standard | IEC/EN 61000-4-8 |
| Required Performance | A |
| Frequency Range | 50/60 Hz |
| Field Strength | 1 A/m |
| Observation Time | 1 minute |
| Inductance Coil | Rectangular type, 1mx1m |

5.9.2 MEASUREMENT INSTRUMENTS

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|-----------------------------------|--------------|--------------------------|------------|------------------|
| 1 | Triaxial ELF Magnetic Field Meter | F.W. BELL | 4190 | 0845014 | May. 13,2016 |
| 2 | Magnetic Field Test Generator | FCC | F-1000-4-8-G-1 25A | 04029 | May. 13,2016 |
| 3 | Magnetic Field Immunity Loop | FCC | F-1000-4-8/9/10-L -1M | 04018 | May. 13,2016 |

Remark: "N/A" denotes No Model Name, No Serial No. or No Calibration specified.

5.9.3 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m*1m min. and 0.65mm thick min.

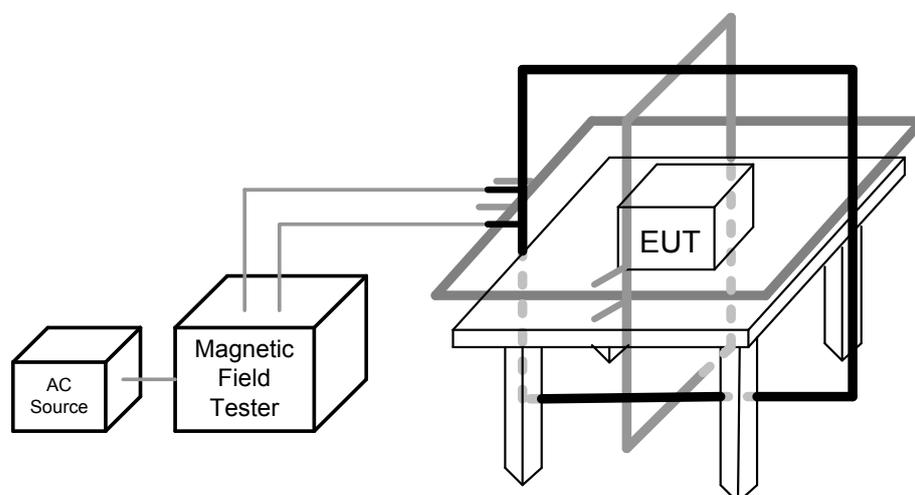
The other condition as following manner:

- a. The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.
- b. The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.

5.9.4 DEVIATION FROM TEST STANDARD

No deviation

5.9.5 TEST SETUP



Note:

TABLE-TOP EQUIPMENT

The equipment shall be subjected to the test magnetic field by using the induction coil of standard dimension (1 m x 1 m). The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

FLOOR-STANDING EQUIPMENT

The equipment shall be subjected to the test magnetic field by using induction coils of suitable dimensions. The test shall be repeated by moving and shifting the induction coils, in order to test the whole volume of the EUT for each orthogonal direction. The test shall be repeated with the coil shifted to different positions along the side of the EUT, in steps corresponding to 50 percent of the shortest side of the coil. The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

5.9.6 TEST RESULTS

| | | | |
|--------------|---|-------------------|----------|
| EUT | Network Video Recorder | Model Name | SVR-2104 |
| Temperature | 23°C | Relative Humidity | 46% |
| Test Voltage | AC 230V/50Hz | | |
| Test Mode | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) | | |

| Test Mode | Test Level | Antenna aspect | Duration (s) | Criterion | Result | Judgment |
|-----------|-------------------|----------------|--------------|-----------|--------|----------|
| Enclosure | 1 A/m 50/60 Hz | X | 60 | A | A | PASS |
| Enclosure | 1 A/m 50/60 Hz | Y | 60 | A | A | PASS |
| Enclosure | 1 A/m 50/60 Hz | Z | 60 | A | A | PASS |

Note:

- 1) N/A - denotes test is not applicable in this test report
- 2) Criterion A: No observation of any performance degradation.
- 3) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 4) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.

5.10 VOLTAGE DIPS, SHORT INTERRUPTIONS AND VOLTAGE VARIATIONS IMMUNITY TEST

5.10.1 TEST SPECIFICATION

| | |
|------------------------|---|
| Basic Standard | IEC/EN 61000-4-11 |
| Required Performance | B (For >95% Voltage Dips) C (For 30% Voltage Dips) C (For >95% Voltage Interruptions) |
| Test Duration Time | Minimum three test events in sequence |
| Interval between Event | Minimum ten seconds |
| Phase Angle | 0°/180° |
| Test Cycle | 3 times |

5.10.2 MEASUREMENT INSTRUMENTS

| Item | Kind of Equipment | Manufacturer | Type No. | Serial No. | Calibrated until |
|------|--|--------------|------------------------|------------|------------------|
| 1 | EMC Immunity Test System | TESEQ | NSG 3060 | 1558 | Jan 26, 2016 |
| 2 | EMC Immunity Test System | TESEQ | CDN 3061 | 1452 | Jan 26, 2016 |
| 3 | Single motor driven variable transformer | TESEQ | VAR 3005-S16 | 844 | Jan 26, 2016 |
| 4 | Measurement Software | TESEQ | WIN 3000 (Version 1.2) | N/A | N/A |

Remark: "N/A" denotes No Model Name, No Serial No. or No Calibration specified.

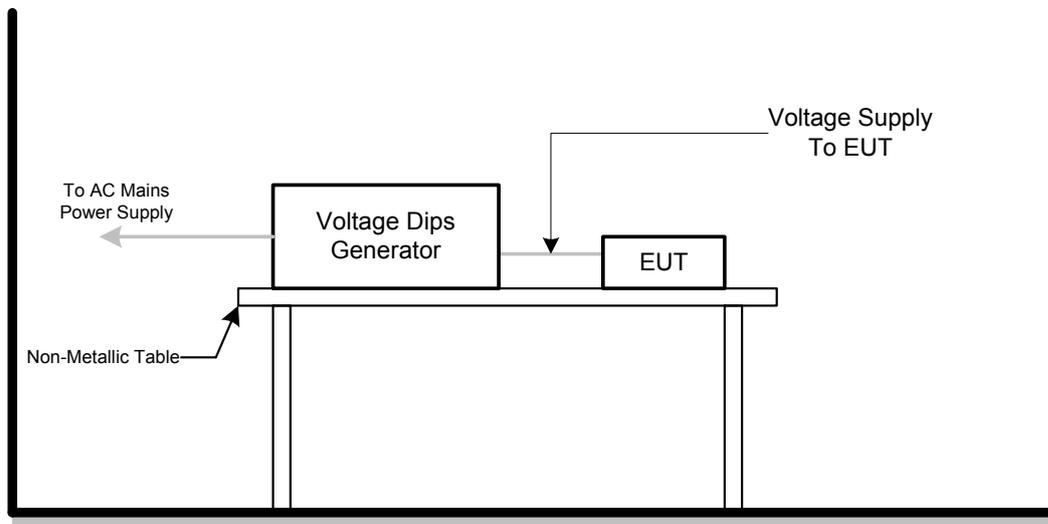
5.10.3 TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

5.10.4 DEVIATION FROM TEST STANDARD

No deviation

5.10.5 TEST SETUP



5.10.6 TEST RESULTS

| | | | |
|--------------|---|-------------------|----------|
| EUT | Network Video Recorder | Model Name | SVR-2104 |
| Temperature | 23°C | Relative Humidity | 46% |
| Test Voltage | AC 230V/50Hz | | |
| Test Mode | FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD) | | |

| AC 100V/50Hz | | | | |
|----------------------------|--------------------|-----------|----------|-------------|
| Voltage Reduction | Duration (Periods) | Criterion | Result | Judgment |
| Voltage Dips >95% | 0.5 | B | A | PASS |
| Voltage Dips 30% | 25 | C | A | PASS |
| Voltage Interruptions >95% | 250 | C | C | PASS |

| AC 230V/50Hz | | | | |
|----------------------------|--------------------|-----------|----------|-------------|
| Voltage Reduction | Duration (Periods) | Criterion | Result | Judgment |
| Voltage Dips >95% | 0.5 | B | A | PASS |
| Voltage Dips 30% | 25 | C | A | PASS |
| Voltage Interruptions >95% | 250 | C | C | PASS |

| AC 240V/50Hz | | | | |
|----------------------------|--------------------|-----------|----------|-------------|
| Voltage Reduction | Duration (Periods) | Criterion | Result | Judgment |
| Voltage Dips >95% | 0.5 | B | A | PASS |
| Voltage Dips 30% | 25 | C | A | PASS |
| Voltage Interruptions >95% | 250 | C | C | PASS |

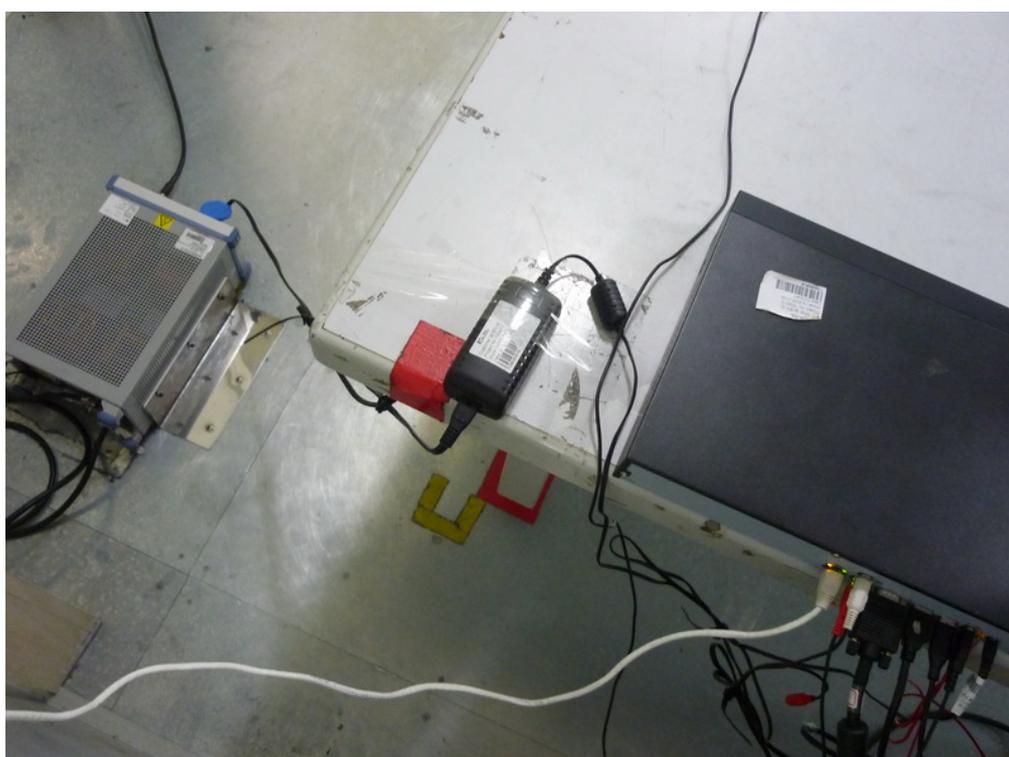
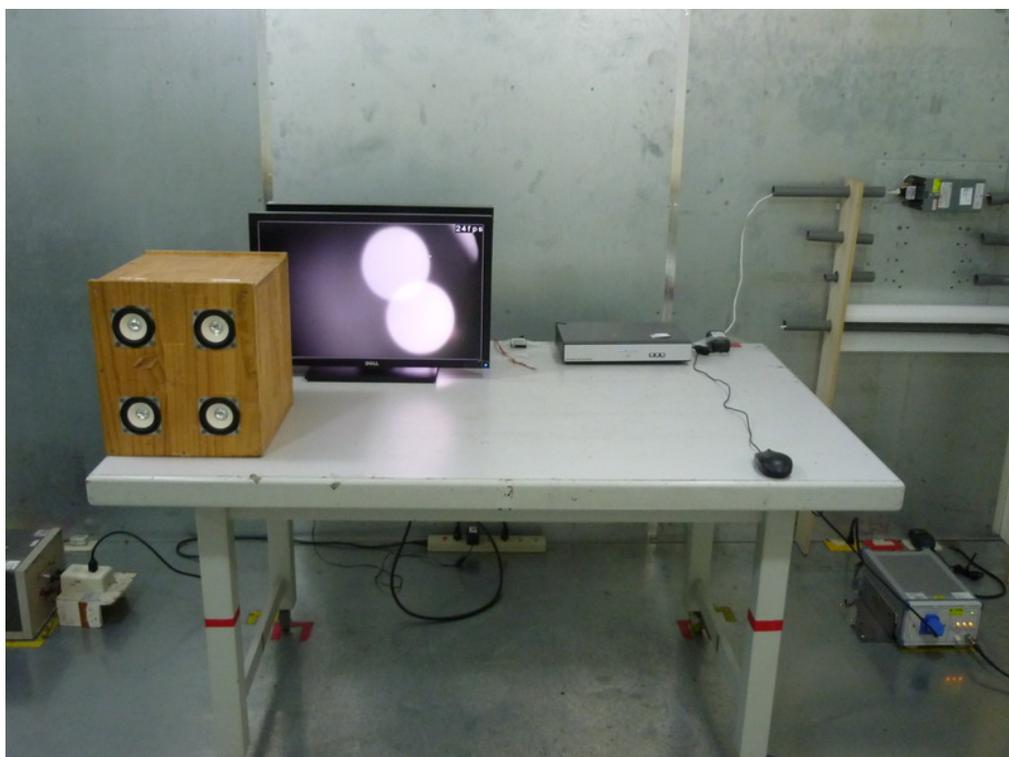
Note:

- 1). N/A - denotes test is not applicable in this test report.
- 2) Criterion A: No observation of any performance degradation.
- 3) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 4) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.

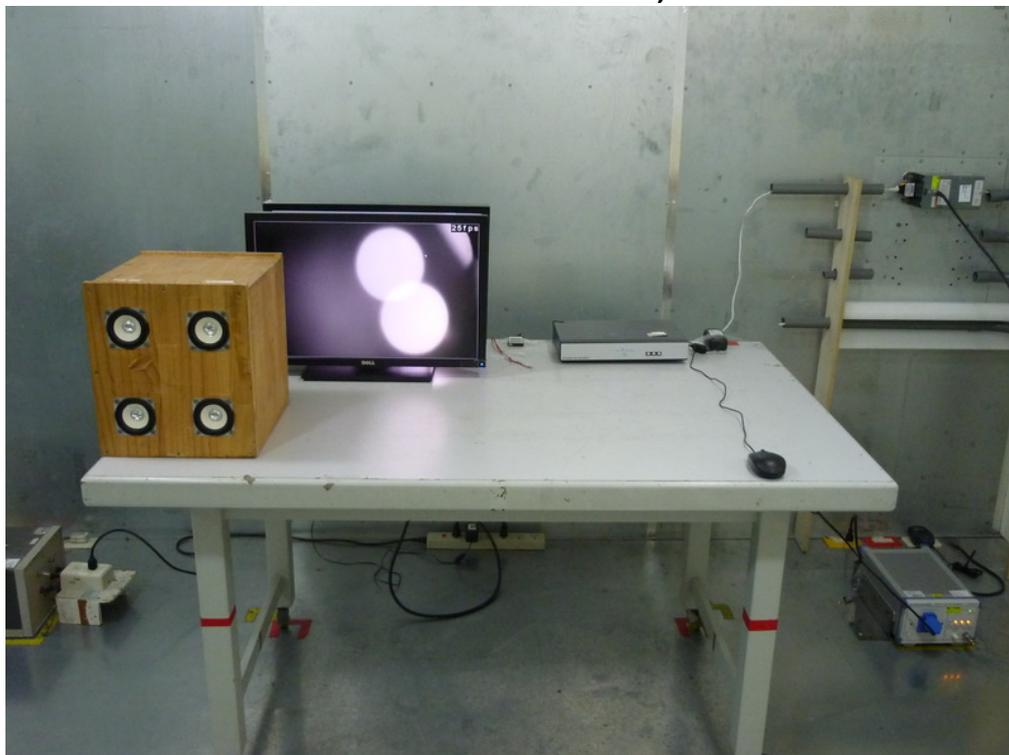
6. EUT TEST PHOTO

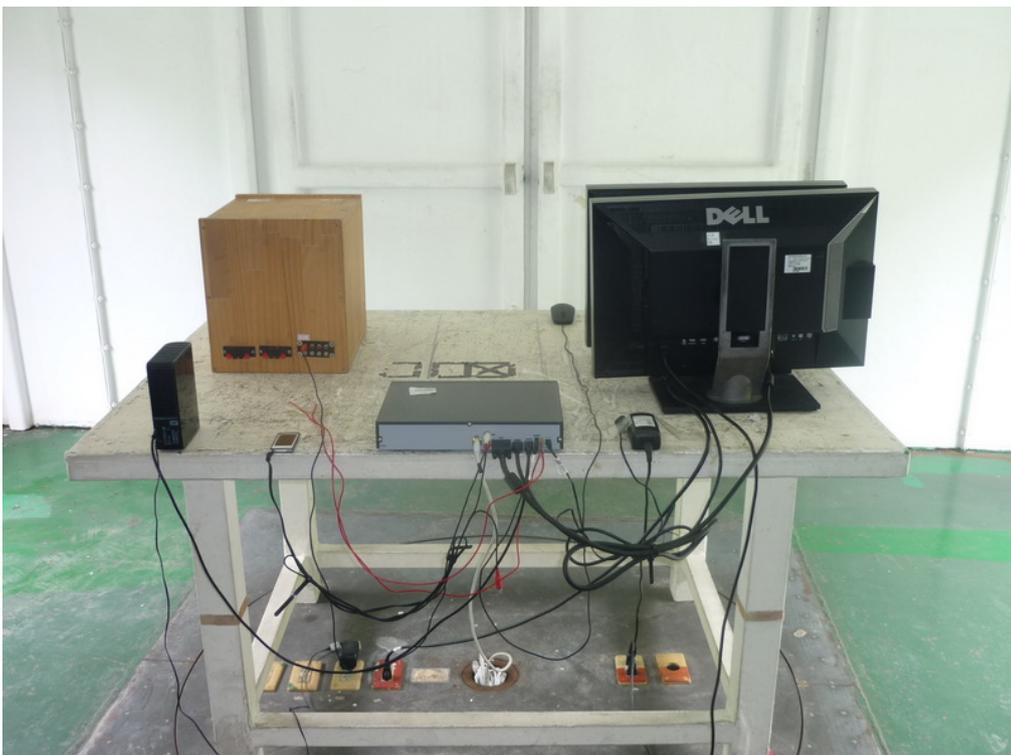
Conducted Disturbance at Mains Ports

FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD)



**Conducted Disturbance at Telecommunication Ports
FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD)(ETHERNET 1G-1G/
100M-100M/ 10M-10M)**



Radiated Disturbance (Below 1GHz)**FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD)**

Radiated Disturbance (Above 1GHz)

FULL SYSTEM D-SUB+HDMI 1920*1080/60Hz(RECORD)

