



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

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

Telephone: +86 (0) 21 6191 5666

Fax: +86 (0) 21 6191 5678

ee.shanghai@sgs.com

Report No.: SHEM180300200301

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## TEST REPORT

**Application No.:** SHEM1803002003IT  
**Applicant:** Zhejiang Dahua Vision Technology Co., Ltd.  
**Address of Applicant:** No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China  
**Manufacturer:** Zhejiang Dahua Vision Technology Co., Ltd.  
**Address of Manufacturer:** No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China  
**Factory:** 1, ZHEJIANG DAHUA VISION TECHNOLOGY CO., LTD.  
2, ZHEJIANG DAHUA ZHILIAN CO.,LTD.  
**Address of Factory:** 1, No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China  
2, No.28, Dongqiao Road, Dongzhou Street, Fuyang District, Hangzhou, P.R. China.

### Equipment Under Test (EUT):

**EUT Name:** Digital Video Recorder

**Model No.:** Refer to page 2; ☐

☐

Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.

### Trade mark:



**Standard(s) :** EN 55032:2015 (Class B), EN 61000-3-2:2014,  
EN 61000-3-3:2013, EN 55024:2010 +A1:2015,  
EN 50130-4:2011 +A1:2014, EN 55035:2017

**Date of Receipt:** 2018-03-20

**Date of Test:** 2018-03-21 to 2018-03-27

**Date of Issue:** 2018-04-17

|                     |              |
|---------------------|--------------|
| <b>Test Result:</b> | <b>Pass*</b> |
|---------------------|--------------|

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

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EU Declaration of Conformity and compliance with all relevant EU Directives.



Parlam Zhan  
E&E Section Manager

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

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**Model No.:**

DH-XVR5108HE-X, DH-XVR5108HS-X, XVR5108HS-X, DH-XVR5104HS-4KL-X, XVR5104HS-4KL-X, DH-HCVR5108HS-V5, DH-HCVR7104HS-V5, DH-XVR5104HS-X, DH-XVR5104H-X, DH-XVR4104HS-X, DH-XVR4108HS-X, DH-XVR5108HS-4KL-X, XVR5108HS-4KL-X, DH-HCVR7108HS-V5, DH-XVR5108H-4KL-X, XVR5108H-4KL-X, DH-XVR7108HE-4KL-X, XVR7108HE-4KL-X, DH-HCVR7104H-4M-V5, DH-XVR5116H-X, XVR5116H-X, DH-XVR5116HE-X, XVR5116HE-X, X51A3E, X51A3E1, X51A3E2, DH-XVR4116HS-X, XVR4116HS-X, DH-XVR7108HE-4K-X, XVR7108HE-4K-X, DH-HCVR7108H-4M-V5, XVR5104HS-X, XVR4104HS-X, XVR4108HS-X, DH-XVR5108H-X, XVR5108H-X, DH-XVR5104H-4KL-X, XVR5104H-4KL-X, XVR5108HE-X, DH-XVR7104HE-4KL-X, XVR7104HE-4KL-X, X51A2E, X51A2E1, X51A2E2, DH-XVR5104HE-X, X51A1E, X51A1E1, X51A1E2, XVR5104H-X, XVR5104HE-X, DH-XVR5116HS-X, XVR5116HS-X, DH-HCVR5116HS-V5



| Revision Record |             |            |        |
|-----------------|-------------|------------|--------|
| Version         | Description | Date       | Remark |
| 00              | Original    | 2018-04-17 | /      |
|                 |             |            |        |
|                 |             |            |        |

|                          |  |  |  |  |
|--------------------------|--|--|--|--|
| Authorized for issue by: |  |  |  |  |
|                          |  |   |  |  |
|                          |  | <hr/> Bruce Tang /Project Engineer   |  |  |
|                          |  |  |  |  |
|                          |  | <hr/> Zenger Zhang /Reviewer   |  |  |

## 2 Test Summary

| <b>Emission Part</b>                                  |                   |                   |                          |               |
|---|-------------------|-------------------|--------------------------|---------------|
| <b>Item</b>   | <b>Standard</b>   | <b>Method</b>     | <b>Requirement</b>       | <b>Result</b> |
| Conducted Emissions at Mains Terminals (150kHz-30MHz) | EN 55032:2015     | EN 55032:2015     | Class B                  | Pass          |
| Asymmetric Mode Conducted Emissions (150kHz-30MHz)    | EN 55032:2015     | EN 55032:2015     | Class B                  | Pass          |
| Radiated Emissions (30MHz-1GHz)                       | EN 55032:2015     | EN 55032:2015     | Class B                  | Pass          |
| Radiated Emissions (above 1GHz)                       | EN 55032:2015     | EN 55032:2015     | Class B                  | Pass          |
| Harmonic Current Emission                             | EN 61000-3-2:2014 | EN 61000-3-2:2014 | Class A                  | N/A           |
| Voltage Fluctuations and Flicker                      | EN 61000-3-3:2013 | EN 61000-3-3:2013 | Clause 5 of EN 61000-3-3 | Pass          |

N/A: Please refer to Section 6.4 of this report for details.

| <b>Immunity Part</b>   |                          |                                    |  |               |
|--|--------------------------|------------------------------------|--|---------------|
| <b>Item</b>  | <b>Standard</b>          | <b>Method</b>                      | <b>Requirement</b>                                 | <b>Result</b> |
| Electrostatic Discharge  | EN 55024:2010 +A1:2015   | EN 61000-4-2:2009                  | 4kV Contact Discharge<br>8kV Air Discharge         | Pass          |
| Electrostatic Discharge  | EN 50130-4:2011 +A1:2014 | EN 61000-4-2:2009                  | 6kV Contact Discharge<br>2,4,8kV Air Discharge     | Pass          |
| Electrostatic Discharge  | EN 55035:2017            | EN 61000-4-2:2009                  | 4kV Contact Discharge<br>8kV Air Discharge         | Pass          |
| Radiated Immunity (80MHz-1GHz, 1800MHz, 2600 MHz, 3500MHz, 5000 MHz) | EN 55035:2017            | EN 61000-4-3:2006 +A1:2008+A2:2010 | 3V/m, 80%, 1kHz Amp. Mod.                          | Pass          |
| Radiated Immunity (80MHz-1GHz)                                       | EN 55024:2010 +A1:2015   | EN 61000-4-3:2006 +A1:2008+A2:2010 | 3V/m, 80%, 1kHz Amp. Mod.                          | Pass          |
| Radiated Immunity (80MHz-2.7GHz)                                     | EN 50130-4:2011 +A1:2014 | EN 61000-4-3:2006 +A1:2008+A2:2010 | 10V/m, 80%, 1kHz sinusoidal Amp. Mod.              | Pass          |
| Electrical Fast Transients/Burst at Power Port                       | EN 55024:2010 +A1:2015   | EN 61000-4-4:2012                  | 1kV<br>5/50ns Tr/Td<br>5kHz Repetition Frequency   | Pass          |
| Electrical Fast Transients/Burst at Power Port                       | EN 50130-4:2011 +A1:2014 | EN 61000-4-4:2012                  | 2kV<br>5/50ns Tr/Td<br>100kHz Repetition Frequency | Pass          |



| Immunity Part                                   |                             |                   |  |        |
|---|-----------------------------|-------------------|--|--------|
| Item  | Standard                    | Method            | Requirement  | Result |
| Electrical Fast Transients/Burst at Power Port  | EN 55035:2017               | EN 61000-4-4:2012 | 1kV<br>5/50ns Tr/Td<br>5kHz Repetition Frequency                   | Pass   |
| Electrical Fast Transients/Burst at Signal Port | EN 55024:2010<br>+A1:2015   | EN 61000-4-4:2012 | 0.5kV<br>5/50ns Tr/Td<br>5kHz Repetition Frequency                 | Pass   |
| Electrical Fast Transients/Burst at Signal Port | EN 50130-4:2011<br>+A1:2014 | EN 61000-4-4:2012 | 1kV<br>5/50ns Tr/Td<br>100kHz Repetition Frequency                 | Pass   |
| Electrical Fast Transients/Burst at Signal Port | EN 55035:2017               | EN 61000-4-4:2012 | 0.5kV<br>5/50ns Tr/Td<br>5kHz Repetition Frequency                 | Pass   |
| Surge at Power Port                             | EN 55024:2010<br>+A1:2015   | EN 61000-4-5:2014 | 1.2/50µs Tr/Td<br>1kV Line to Line<br>2kV Line to Ground           | Pass   |
| Surge at Power Port                             | EN 50130-4:2011<br>+A1:2014 | EN 61000-4-5:2014 | 1.2/50µs Tr/Td<br>0.5,1kV Line to Line<br>0.5,1,2kV Line to Ground | Pass   |
| Surge at Power Port                             | EN 55035:2017               | EN 61000-4-5:2014 | 1.2/50µs Tr/Td<br>1kV Line to Line<br>2kV Line to Ground           | Pass   |
| Surge at Signal Port                            | EN 55024:2010<br>+A1:2015   | EN 61000-4-5:2014 | 1.2/50µs Tr/Td<br>1kV Line to Ground                               | Pass   |
| Surge at Signal Port                            | EN 50130-4:2011<br>+A1:2014 | EN 61000-4-5:2014 | 1.2/50µs Tr/Td<br>0.5,1kV Line to Ground                           | Pass   |
| Surge at Signal Port                            | EN 55035:2017               | EN 61000-4-5:2014 | 1.2/50µs Tr/Td<br>1kV Line to Ground                               | Pass   |
| Conducted Immunity at Power Port (150kHz-80MHz) | EN 55024:2010<br>+A1:2015   | EN 61000-4-6:2014 | 3Vrms<br>(emf),80%,1kHz<br>Amp. Mod.                               | Pass   |



| Immunity Part                                     |                          |                    |   |        |
|---|--------------------------|--------------------|---|--------|
| Item  | Standard                 | Method             | Requirement   | Result |
| Conducted Immunity at Power Port (150kHz-80MHz)   | EN 55035:2017            | EN 61000-4-6:2014  | 3 Vrms: 0.15MHz - 10MHz<br>3 to 1 (Lines)<br>Vrms: 10MHz - 30MHz<br>1 Vrms: 30MHz - 80MHz<br>80%,1kHz Amp. Mod. | Pass   |
| Conducted Immunity at Signal Port (150kHz-80MHz)  | EN 55024:2010 +A1:2015   | EN 61000-4-6:2014  | 3Vrms (emf),80%,1kHz Amp. Mod.  | Pass   |
| Conducted Immunity at Signal Port (150kHz-80MHz)  | EN 55035:2017            | EN 61000-4-6:2014  | 3 Vrms: 0.15MHz - 10MHz<br>3 to 1 (Lines)<br>Vrms: 10MHz - 30MHz<br>1 Vrms: 30MHz - 80MHz<br>80%,1kHz Amp. Mod. | Pass   |
| Conducted Immunity at Power Port (150kHz-100MHz)  | EN 50130-4:2011 +A1:2014 | EN 61000-4-6:2014  | 10Vrms (emf),80%,1kHz sinusoidal Amp. Mod.  | Pass   |
| Conducted Immunity at Signal Port (150kHz-100MHz) | EN 50130-4:2011 +A1:2014 | EN 61000-4-6:2014  | 10Vrms (emf),80%,1kHz sinusoidal Amp. Mod.  | Pass   |
| Voltage Dips and Interruptions                    | EN 55024:2010 +A1:2015   | EN 61000-4-11:2004 | 0 % UT for 0.5per<br>0 % UT for 250per<br>70 % UT for 25per<br>UT is Supply Voltage                             | Pass   |
| Voltage Dips and Interruptions                    | EN 50130-4:2011 +A1:2014 | EN 61000-4-11:2004 | 80 % UT for 250per<br>70 % UT for 25per<br>40 % UT for 10per<br>0 % UT for 250per<br>UT is Supply Voltage       | Pass   |

| <b>Immunity Part</b>                         |                          |                         |  |               |
|--|--------------------------|-------------------------|--|---------------|
| <b>Item</b>                                  | <b>Standard</b>          | <b>Method</b>           | <b>Requirement</b>   | <b>Result</b> |
| Voltage Dips and Interruptions               | EN 55035:2017            | EN 61000-4-11:2004      | <5% residual voltage for 0.5 periods: B<br>70% residual voltage for 25 periods: C<br><5% residual voltage for 250 periods: C | Pass          |
| Mains Supply Voltage Variations-Conditioning | EN 50130-4:2011 +A1:2014 | EN 50130-4:2011+A1:2014 | Unom+10%<br>Unom-15%   | Pass          |

| <b>InternalSource</b> | <b>UpperFrequency</b>                                     |
|-----------------------|---|
| Below 108MHz          | 1GHz  |
| 108MHz to 500MHz      | 2GHz  |
| 500MHz to 1GHz        | 5GHz  |
| Above 1GHz            | 5 times the highest frequency or 6 GHz, whichever is less |

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

There are series models mentioned in this report and they are the similar in electrical and electronic characters. Only the model DH-XVR5108HE-X was tested since their differences are software functions and customers.

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## 4 General Information

### 4.1 Details of E.U.T.

Power supply: DC12V  
 Adapter : ADS-25FSG-12 12024GPG ,  
 input : AC100-240V 50/60Hz , output : DC12V  
 Cable: DC output cable for adapter : about 1.5m

### 4.2 Description of Support Units

| Description    | Manufacturer     | Model No.        | Serial No. |
|----------------|------------------|------------------|------------|
| AC Adapter     | HOIOTO           | ADS-25FSG-12     | /          |
| Hard disk      | WD               | WD30PURX         | /          |
| Headset        | HYUNDAI          | HY-R362          | /          |
| Laptop         | LENOVO           | X100e            | /          |
| Monitor        | DELL             | ST2220Lb         | /          |
| Network Camera | /                | DS-2CD893PF-E    | /          |
| USB Disk       | SanDisk          | Cruzer Blade 8GB | /          |
| USB Mouse      | 3D Optical Mouse | --               | /          |

### 4.3 Measurement Uncertainty

| No. | Item  | Measurement Uncertainty |
|-----|---|-------------------------|
| 1   | Conducted Emission<br>at mains port using AMN             | 3.2dB (9kHz to 150kHz)  |
|     |   | 3.0dB (150kHz to 30MHz) |
| 2   | Conducted Emission<br>at mains port using VP              | 1.9 dB(9kHz to 30MHz)   |
| 3   | Conducted Emission<br>at telecommunication port using AAN | 2.4 dB(150kHz to 30MHz) |
| 4   | Radiated Power  | 3.5dB                   |
| 5   | Radiated emission   | 4.4dB (30MHz-1GHz )     |
|     |   | 4.6dB (1GHz-6GHz )      |

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



#### 4.4 Test Location

All tests were performed at:

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

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

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

No tests were sub-contracted.

#### 4.5 Test Facility

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

- **CNAS (No. CNAS L0599)**

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

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

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

- **FCC –Designation Number: CN5033**

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

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

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

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

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-3868,C-4336,T-12221,G-10830 respectively.

#### 4.6 Deviation from Standards

None

#### 4.7 Abnormalities from Standard Conditions

None

#### 4.8 Monitoring of EUT for All Immunity Test

Visual: work status and video quality

## 5 Equipment List

| Conducted Emissions at Mains Terminals (150kHz-30MHz) |                 |          |              |            |              |
|---|-----------------|----------|--------------|------------|--------------|
| Equipment   | Manufacturer    | Model No | Inventory No | Cal Date   | Cal Due Date |
| EMI test receiver                                     | Rohde & Schwarz | ESR7     | SHEM162-1    | 2017-12-20 | 2018-12-19   |
| Line impedance stabilization network                  | SCHWARZBECK     | NSLK8127 | SHEM061-1    | 2017-12-20 | 2018-12-19   |
| Line impedance stabilization network                  | EMCO            | 3816/2   | SHEM019-1    | 2017-12-20 | 2018-12-19   |
| Pulse limiter   | Rohde & Schwarz | ESH3-Z2  | SHEM029-1    | 2017-12-20 | 2018-12-19   |
| Shielding Room  | ZHONGYU         | 8*4*3M   | SHEM079-2    | 2017-12-20 | 2018-12-19   |
| CE test Cable   | /               | /        | CE01         | 2017-12-26 | 2018-12-25   |

| Asymmetric Mode Conducted Emissions (150kHz-30MHz) |                               |           |              |            |              |
|--|-------------------------------|-----------|--------------|------------|--------------|
| Equipment  | Manufacturer                  | Model No  | Inventory No | Cal Date   | Cal Due Date |
| EMI test receiver                                  | Rohde & Schwarz               | ESR7      | SHEM162-1    | 2017-12-20 | 2018-12-19   |
| Line impedance stabilization network               | SCHWARZBECK                   | NSLK8127  | SHEM061-1    | 2017-12-20 | 2018-12-19   |
| 8-wire ISN cat 5                                   | SCHWARZBECK                   | CAT5 8158 | SHEM137-1    | 2017-12-20 | 2018-12-19   |
| 8-wire ISN cat 3                                   | SCHWARZBECK                   | CAT3 8158 | SHEM137-2    | 2017-12-20 | 2018-12-19   |
| 8-wire ISNcat 6                                    | SCHWARZBECK                   | NTFM8158  | SHEM137-3    | 2017-12-26 | 2018-12-25   |
| 2-Draht ISN  | Schwarzbeck - Mess-Elektronik | NTFM 8131 | SHEM139-1    | 2017-12-20 | 2018-12-19   |
| CE test Cable                                      | /                             | /         | CE01         | 2017-12-26 | 2018-12-25   |

| Radiated Emissions (30MHz-1GHz) |                 |                   |              |            |              |
|---------------------------------|-----------------|-------------------|--------------|------------|--------------|
| Equipment                       | Manufacturer    | Model No          | Inventory No | Cal Date   | Cal Due Date |
| EMI test receiver               | Rohde & Schwarz | ESU40             | SHEM051-1    | 2017-09-26 | 2018-09-25   |
| CONTROLLER                      | INNCO           | CO200             | SHEM047-1    | N/A        | N/A          |
| ANTENNA MAST                    | INNCO           | MA400-EP          | SHEM047-2    | N/A        | N/A          |
| TURN DEVICE                     | INNCO           | DE 3600-RH        | SHEM047-3    | N/A        | N/A          |
| Broadband UHF-VHF ANTENNA       | SCHWARZBECK     | VULB9168          | SHEM048-1    | 2017-02-28 | 2020-02-27   |
| Semi/Fully Anechoic             | ST              | 11*6*6M           | SHEM078-2    | 2017-07-22 | 2018-07-21   |
| Low Amplifier                   | CLAVIIO         | BDLNA-0001-412010 | SHEM164-1    | 2017-08-22 | 2018-08-21   |

| Radiated Emissions (above 1GHz)      |                 |                      |              |            |              |
|--------------------------------------|-----------------|----------------------|--------------|------------|--------------|
| Equipment                            | Manufacturer    | Model No             | Inventory No | Cal Date   | Cal Due Date |
| EMI test receiver                    | Rohde & Schwarz | ESU40                | SHEM051-1    | 2017-09-26 | 2018-09-25   |
| CONTROLLER                           | INNCO           | CO200                | SHEM047-1    | N/A        | N/A          |
| ANTENNA MAST                         | INNCO           | MA400-EP             | SHEM047-2    | N/A        | N/A          |
| TURN DEVICE                          | INNCO           | DE 3600-RH           | SHEM047-3    | N/A        | N/A          |
| Double ridged broadband horn ANTENNA | SCHWARZBECK     | BBHA9120D            | SHEM050-1    | 2017-01-14 | 2020-01-13   |
| High-amplifier                       | SCHWARZBECK     | SCU-F0118-G40-BZ4-CS | SHEM050-2    | 2017-12-20 | 2018-12-19   |
| Semi/Fully Anechoic                  | ST              | 11*6*6M              | SHEM078-2    | 2017-07-22 | 2018-07-21   |



| Voltage Fluctuations and Flicker |              |          |              |            |              |
|----------------------------------|--------------|----------|--------------|------------|--------------|
| Equipment                        | Manufacturer | Model No | Inventory No | Cal Date   | Cal Due Date |
| Harmonic&Flicker analyzer        | AMETEK       | PACS-1   | SHEM024-2    | 2017-08-22 | 2018-08-21   |
| AC Power Source 5KVA             | AMETEK       | 5001iX   | SHEM025-2    | 2017-08-22 | 2018-08-21   |

| Electrostatic Discharge           |              |          |              |            |              |
|-----------------------------------|--------------|----------|--------------|------------|--------------|
| Equipment                         | Manufacturer | Model No | Inventory No | Cal Date   | Cal Due Date |
| Electrostatic Discharge Simulator | TESEQ        | NSG 437  | SHEM041-1    | 2017-09-26 | 2018-09-25   |

| Radiated Immunity           |                 |              |              |            |              |
|-----------------------------|-----------------|--------------|--------------|------------|--------------|
| Equipment                   | Manufacturer    | Model No     | Inventory No | Cal Date   | Cal Due Date |
| Signal generator            | Rohde & Schwarz | SMJ100A      | SHEM141-1    | 2017-09-26 | 2018-09-25   |
| Power Meter                 | Rohde & Schwarz | NRP          | SHEM057-1    | 2017-12-20 | 2018-12-19   |
| Power meter sensor          | Rohde & Schwarz | NRP-Z91      | SHEM057-2    | 2017-12-20 | 2018-12-19   |
| Antenna                     | SCHWARZBECK     | STLP9128D    | SHEM130-1    | N/A        | N/A          |
| Amplifier                   | MILMEGA         | AS0840-55-55 | SHEM133-1    | N/A        | N/A          |
| Power meter sensor          | Rohde & Schwarz | NRP-Z22      | SHEM136-1    | 2017-12-19 | 2018-12-18   |
| ElectroMagnetic Field Probe | ETS-Lindgren    | HI-6113      | SHEM134-1    | 2017-12-19 | 2018-12-18   |
| Semi/Fully Anechoic         | ST              | 11*6*6M      | SHEM078-2    | 2017-07-22 | 2018-07-21   |

| Electrical Fast Transients/Burst at Power Port |              |                 |              |            |              |
|--|--------------|-----------------|--------------|------------|--------------|
| Equipment                                      | Manufacturer | Model No        | Inventory No | Cal Date   | Cal Due Date |
| Immunity Test System                           | EMC PARTNER  | TRA3000 F-S-D-V | SHEM163-1    | 2017-12-20 | 2018-12-19   |

| Electrical Fast Transients/Burst at Signal Port |              |                 |              |            |              |
|---|--------------|-----------------|--------------|------------|--------------|
| Equipment                                       | Manufacturer | Model No        | Inventory No | Cal Date   | Cal Due Date |
| Immunity Test System                            | EMC PARTNER  | TRA3000 F-S-D-V | SHEM163-1    | 2017-12-20 | 2018-12-19   |
| Capacitive coupling clamp                       | EM test      | HFK             | SHEM026-2    | 2017-12-20 | 2018-12-19   |
| Data coupling network 4 line                    | EM test      | CNV 504         | SHEM026-3    | 2017-12-20 | 2018-12-19   |

| Surge at Power Port  |              |                 |              |            |              |
|----------------------|--------------|-----------------|--------------|------------|--------------|
| Equipment            | Manufacturer | Model No        | Inventory No | Cal Date   | Cal Due Date |
| Immunity Test System | EMC PARTNER  | TRA3000 F-S-D-V | SHEM163-1    | 2017-12-20 | 2018-12-19   |

| Surge at Signal Port         |              |                 |              |            |              |
|------------------------------|--------------|-----------------|--------------|------------|--------------|
| Equipment                    | Manufacturer | Model No        | Inventory No | Cal Date   | Cal Due Date |
| Immunity Test System         | EMC PARTNER  | TRA3000 F-S-D-V | SHEM163-1    | 2017-12-20 | 2018-12-19   |
| Data coupling network 4 line | EM test      | CNV 504         | SHEM026-3    | 2017-12-20 | 2018-12-19   |





| Conducted Immunity at Power Port (150kHz-80MHz) |                 |             |              |            |              |
|---|-----------------|-------------|--------------|------------|--------------|
| Equipment                                       | Manufacturer    | Model No    | Inventory No | Cal Date   | Cal Due Date |
| Signal generator                                | Rohde & Schwarz | SMJ100A     | SHEM141-1    | 2017-09-26 | 2018-09-25   |
| PAMP Conducted RF test system                   | HAEFFLY         | PAMP250     | SHEM023-1    | 2017-12-20 | 2018-12-19   |
| 6dB Attenuator                                  | HUAXIANG        | TST-150-761 | SHEM151-1    | N/A        | N/A          |
| Coupling clamp                                  | LIITHI          | EM 101      | SHEM027-1    | 2017-12-20 | 2018-12-19   |
| CDN impedance and K-factor                      | LUTHI           | L-801 M1    | SHEM023-5    | 2017-12-20 | 2018-12-19   |
| CDN impedance and K-factor                      | LUTHI           | L-801 M2/M3 | SHEM023-6    | 2017-12-20 | 2018-12-19   |
| Shielding Room                                  | ZHONGYU         | 5*5*3M      | SHEM079-6    | 2016-12-29 | 2019-12-28   |

| Conducted Immunity at Signal Port (150kHz-80MHz) |                 |             |              |            |              |
|--|-----------------|-------------|--------------|------------|--------------|
| Equipment  | Manufacturer    | Model No    | Inventory No | Cal Date   | Cal Due Date |
| Signal generator                                 | Rohde & Schwarz | SMJ100A     | SHEM141-1    | 2017-09-26 | 2018-09-25   |
| PAMP Conducted RF test system                    | HAEFFLY         | PAMP250     | SHEM023-1    | 2017-12-20 | 2018-12-19   |
| 6dB Attenuator                                   | HUAXIANG        | TST-150-761 | SHEM151-1    | N/A        | N/A          |
| Coupling clamp                                   | LIITHI          | EM 101      | SHEM027-1    | 2017-12-20 | 2018-12-19   |
| Shielding Room                                   | ZHONGYU         | 5*5*3M      | SHEM079-6    | 2016-12-29 | 2019-12-28   |

| Conducted Immunity at Power Port (150kHz-100MHz) |                 |             |              |            |              |
|--|-----------------|-------------|--------------|------------|--------------|
| Equipment  | Manufacturer    | Model No    | Inventory No | Cal Date   | Cal Due Date |
| Signal generator                                 | Rohde & Schwarz | SMJ100A     | SHEM141-1    | 2017-09-26 | 2018-09-25   |
| PAMP Conducted RF test system                    | HAEFFLY         | PAMP250     | SHEM023-1    | 2017-12-20 | 2018-12-19   |
| 6dB Attenuator                                   | HUAXIANG        | TST-150-761 | SHEM151-1    | N/A        | N/A          |
| CDN impedance and K-factor                       | LUTHI           | L-801 M1    | SHEM023-5    | 2017-12-20 | 2018-12-19   |
| CDN impedance and K-factor                       | LUTHI           | L-801 M2/M3 | SHEM023-6    | 2017-12-20 | 2018-12-19   |
| Shielding Room                                   | ZHONGYU         | 5*5*3M      | SHEM079-6    | 2016-12-29 | 2019-12-28   |

| Conducted Immunity at Signal Port (150kHz-100MHz) |                 |             |              |            |              |
|---|-----------------|-------------|--------------|------------|--------------|
| Equipment   | Manufacturer    | Model No    | Inventory No | Cal Date   | Cal Due Date |
| Signal generator                                  | Rohde & Schwarz | SMJ100A     | SHEM141-1    | 2017-09-26 | 2018-09-25   |
| PAMP Conducted RF test system                     | HAEFFLY         | PAMP250     | SHEM023-1    | 2017-12-20 | 2018-12-19   |
| 6dB Attenuator                                    | HUAXIANG        | TST-150-761 | SHEM151-1    | N/A        | N/A          |
| Coupling clamp                                    | LIITHI          | EM 101      | SHEM027-1    | 2017-12-20 | 2018-12-19   |
| CDN impedance and K-factor                        | LUTHI           | L-801 M1    | SHEM023-5    | 2017-12-20 | 2018-12-19   |
| CDN impedance and K-factor                        | LUTHI           | L-801 M2/M3 | SHEM023-6    | 2017-12-20 | 2018-12-19   |

| Voltage Dips and Interruptions |              |                 |              |            |              |
|--------------------------------|--------------|-----------------|--------------|------------|--------------|
| Equipment                      | Manufacturer | Model No        | Inventory No | Cal Date   | Cal Due Date |
| Immunity Test System           | EMC PARTNER  | TRA3000 F-S-D-V | SHEM163-1    | 2017-12-20 | 2018-12-19   |

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| Mains Supply Voltage Variations-Conditioning |              |                 |              |            |              |
|--|--------------|-----------------|--------------|------------|--------------|
| Equipment                                    | Manufacturer | Model No        | Inventory No | Cal Date   | Cal Due Date |
| Immunity Test System                         | EMC PARTNER  | TRA3000 F-S-D-V | SHEM163-1    | 2017-12-20 | 2018-12-19   |

| General used equipment        |                             |            |              |            |              |
|-------------------------------|-----------------------------|------------|--------------|------------|--------------|
| Equipment                     | Manufacturer                | Model No   | Inventory No | Cal Date   | Cal Due Date |
| Digital pressure meter        | YONGZHI                     | DYM3-01    | SHEM082-1    | 2018-01-25 | 2019-01-24   |
| Temperature&humidity recorder | ShangHai weather meter work | ZJ 1-2B    | SHEM042-1~6  | 2017-09-13 | 2018-09-12   |
| Digital Multimeter            | FLUKE                       | 17B        | SHEM043-3    | 2017-09-11 | 2018-09-10   |
| Autoformer regulator          | Guangzhou bao de            | TDGC2-5KVA | SHEM150-1    | N/A        | N/A          |
| Multi-purpose tong tester     | FLUKE                       | 316        | SHEM001-1    | 2017-12-20 | 2018-12-19   |

## 6 Emission Test Results

### 6.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

|                   |  |
|-------------------|--|
| Test Requirement: | EN 55032:2015  |
| Test Method:      | EN 55032:2015  |
| Frequency Range:  | 150kHz to 30MHz  |
| Limit:            |  |
| 0.15M-0.5MHz      | 66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average      |
| 0.5M-5MHz         | 56dB(μV) quasi-peak, 46dB(μV) average                        |
| 5M-30MHz          | 60dB(μV) quasi-peak, 50dB(μV) average                        |
| Detector:         | Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz |

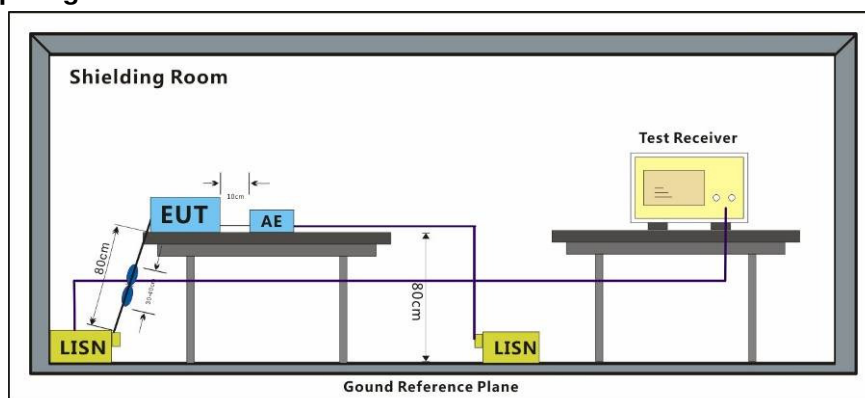
#### 6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1001 mbar

Test mode a: keep EUT monitoring and data running continual .

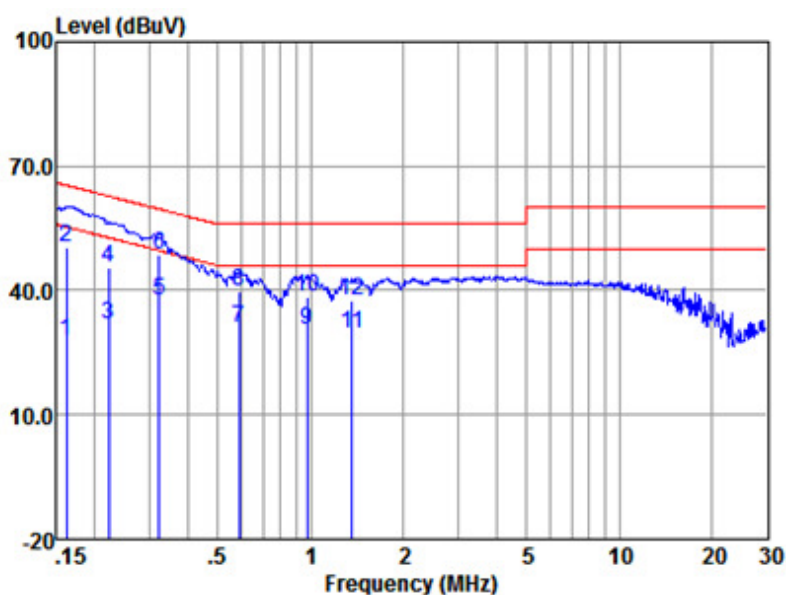
#### 6.1.2 Test Setup Diagram



#### 6.1.3 Measurement Data

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

Mode:a; Line:Live Line

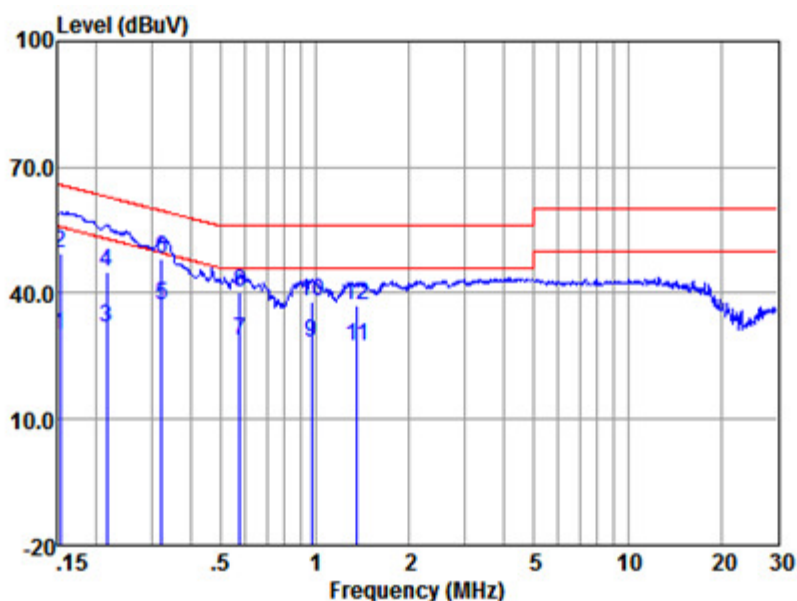


LISN : LINE  
EUT/Project No : 2003IT  
Test Mode : a

|    | Freq<br>(MHz) | Read<br>level<br>(dBuV) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Emission<br>Level<br>(dBuV) | Limit<br>(dBuV) | Over<br>Limit<br>(dB) | Remark  |
|----|---------------|-------------------------|------------------------|-----------------------|-----------------------------|-----------------|-----------------------|---------|
| 1  | 0.16          | 17.99                   | 0.11                   | 9.81                  | 27.91                       | 55.38           | -27.47                | Average |
| 2  | 0.16          | 40.59                   | 0.11                   | 9.81                  | 50.51                       | 65.38           | -14.87                | QP      |
| 3  | 0.22          | 22.02                   | 0.11                   | 9.81                  | 31.94                       | 52.74           | -20.80                | Average |
| 4  | 0.22          | 35.41                   | 0.11                   | 9.81                  | 45.33                       | 62.74           | -17.41                | QP      |
| 5  | 0.32          | 27.81                   | 0.11                   | 9.81                  | 37.73                       | 49.62           | -11.89                | Average |
| 6  | 0.32          | 38.72                   | 0.11                   | 9.81                  | 48.64                       | 59.62           | -10.98                | QP      |
| 7  | 0.59          | 21.15                   | 0.11                   | 9.82                  | 31.08                       | 46.00           | -14.92                | Average |
| 8  | 0.59          | 29.96                   | 0.11                   | 9.82                  | 39.89                       | 56.00           | -16.11                | QP      |
| 9  | 0.97          | 20.37                   | 0.11                   | 9.84                  | 30.32                       | 46.00           | -15.68                | Average |
| 10 | 0.97          | 28.67                   | 0.11                   | 9.84                  | 38.62                       | 56.00           | -17.38                | QP      |
| 11 | 1.37          | 19.80                   | 0.11                   | 9.84                  | 29.75                       | 46.00           | -16.25                | Average |
| 12 | 1.37          | 27.82                   | 0.11                   | 9.84                  | 37.77                       | 56.00           | -18.23                | QP      |

Notes: Emission Level = Read Level + LISN Factor + Cable loss

Mode:a; Line:Neutral Line



LISN : NEUTRAL  
EUT/Project No : 2003IT  
Test Mode : a

|    | Freq<br>(MHz) | Read<br>level<br>(dBUV) | LISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Emission<br>Level<br>(dBUV) | Limit<br>(dBUV) | Over<br>Limit<br>(dB) | Remark  |
|----|---------------|-------------------------|------------------------|-----------------------|-----------------------------|-----------------|-----------------------|---------|
| 1  | 0.15          | 20.30                   | 0.12                   | 9.81                  | 30.23                       | 55.87           | -25.64                | Average |
| 2  | 0.15          | 39.44                   | 0.12                   | 9.81                  | 49.37                       | 65.87           | -16.50                | QP      |
| 3  | 0.22          | 21.89                   | 0.11                   | 9.81                  | 31.81                       | 53.01           | -21.20                | Average |
| 4  | 0.22          | 35.27                   | 0.11                   | 9.81                  | 45.19                       | 63.01           | -17.82                | QP      |
| 5  | 0.32          | 27.19                   | 0.11                   | 9.81                  | 37.11                       | 49.66           | -12.55                | Average |
| 6  | 0.32          | 38.29                   | 0.11                   | 9.81                  | 48.21                       | 59.66           | -11.45                | QP      |
| 7  | 0.58          | 18.95                   | 0.11                   | 9.82                  | 28.88                       | 46.00           | -17.12                | Average |
| 8  | 0.58          | 30.08                   | 0.11                   | 9.82                  | 40.01                       | 56.00           | -15.99                | QP      |
| 9  | 0.97          | 18.43                   | 0.11                   | 9.84                  | 28.38                       | 46.00           | -17.62                | Average |
| 10 | 0.97          | 28.09                   | 0.11                   | 9.84                  | 38.04                       | 56.00           | -17.96                | QP      |
| 11 | 1.37          | 17.62                   | 0.12                   | 9.84                  | 27.58                       | 46.00           | -18.42                | Average |
| 12 | 1.37          | 27.31                   | 0.12                   | 9.84                  | 37.27                       | 56.00           | -18.73                | QP      |

Notes: Emission Level = Read Level + LISN Factor + Cable loss

## 6.2 Asymmetric Mode Conducted Emissions (150kHz-30MHz)

Test Requirement: EN 55032:2015

Test Method: EN 55032:2015

Frequency Range: 150kHz to 30MHz

Limit:

0.15M-0.5MHz(Voltage) 84-74(dBμV) quasi-peak; 74-64(dBμV) average

0.5M-30MHz(Voltage) 74(dBμV) quasi-peak; 64(dBμV) average

0.15M-0.5MHz(Current) 40-30(dBμA) quasi-peak; 30-20(dBμA) average

0.5M-30MHz(Current) 30(dBμA) quasi-peak; 20(dBμA) average

Detector: 9kHz resolution bandwidth 0.15M to 30MHz

Remark: The voltage measured shall be corrected at each frequency of interest as follows:

if the current margin with respect to the current limit is  $\leq 6$  dB, the actual current margin shall be subtracted from the measured voltage;

if the current margin with respect to the current limit is  $> 6$  dB, 6 dB shall be subtracted from the measured voltage.

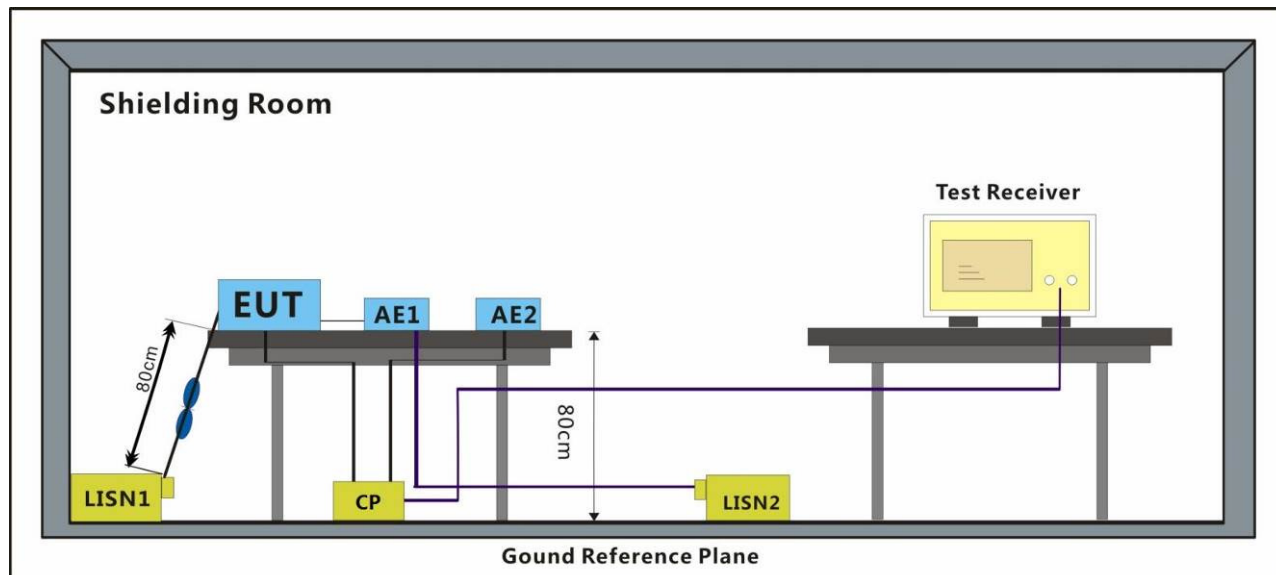
### 6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1001 mbar

Test mode a: keep EUT monitoring and data running continual .

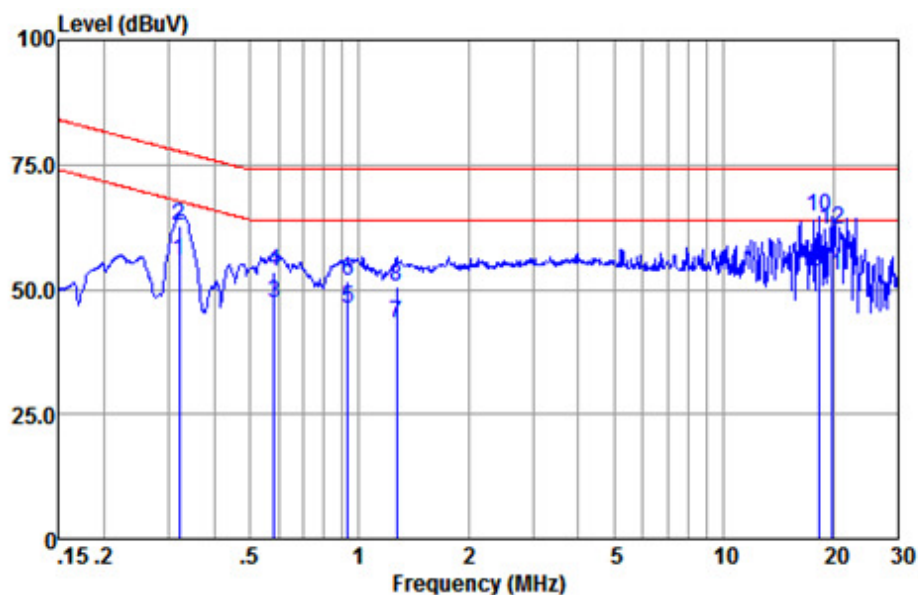
### 6.2.2 Test Setup Diagram



### 6.2.3 Measurement Data



Mode:a



ISN : ISN CAT5

EUT/Project No : 2003IT

Test Mode : a

|    | Freq<br>(MHz) | Read<br>level<br>(dBUV) | ISN<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Emission<br>Level<br>(dBUV) | Limit<br>(dBUV) | Over<br>Limit<br>(dB) | Remark  |
|----|---------------|-------------------------|-----------------------|-----------------------|-----------------------------|-----------------|-----------------------|---------|
| 1  | 0.32          | 36.34                   | 9.54                  | 9.81                  | 55.69                       | 67.66           | -11.97                | Average |
| 2  | 0.32          | 43.48                   | 9.54                  | 9.81                  | 62.83                       | 77.66           | -14.83                | QP      |
| 3  | 0.59          | 27.97                   | 9.42                  | 9.82                  | 47.21                       | 64.00           | -16.79                | Average |
| 4  | 0.59          | 34.36                   | 9.42                  | 9.82                  | 53.60                       | 74.00           | -20.40                | QP      |
| 5  | 0.93          | 26.92                   | 9.36                  | 9.83                  | 46.11                       | 64.00           | -17.89                | Average |
| 6  | 0.93          | 32.52                   | 9.36                  | 9.83                  | 51.71                       | 74.00           | -22.29                | QP      |
| 7  | 1.27          | 24.13                   | 9.32                  | 9.84                  | 43.29                       | 64.00           | -20.71                | Average |
| 8  | 1.27          | 31.29                   | 9.32                  | 9.84                  | 50.45                       | 74.00           | -23.55                | QP      |
| 9  | 18.23         | 34.24                   | 9.28                  | 10.03                 | 53.55                       | 64.00           | -10.45                | Average |
| 10 | 18.23         | 45.21                   | 9.28                  | 10.03                 | 64.52                       | 74.00           | -9.48                 | QP      |
| 11 | 19.74         | 33.60                   | 9.30                  | 10.03                 | 52.93                       | 64.00           | -11.07                | Average |
| 12 | 19.74         | 42.84                   | 9.30                  | 10.03                 | 62.17                       | 74.00           | -11.83                | QP      |

Notes: Emission Level = Read Level +ISN Factor + Cable loss

### 6.3 Radiated Emissions (30MHz-1GHz)

Test Requirement: EN 55032:2015  
 Test Method: EN 55032:2015  
 Frequency Range: 30MHz to 1GHz  
 Measurement Distance: 3m  
 Limit:  
 30MHz-230MHz 40 dB( $\mu$ V/m) quasi-peak  
 230MHz-1GHz 47 dB( $\mu$ V/m) quasi-peak  
 Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz

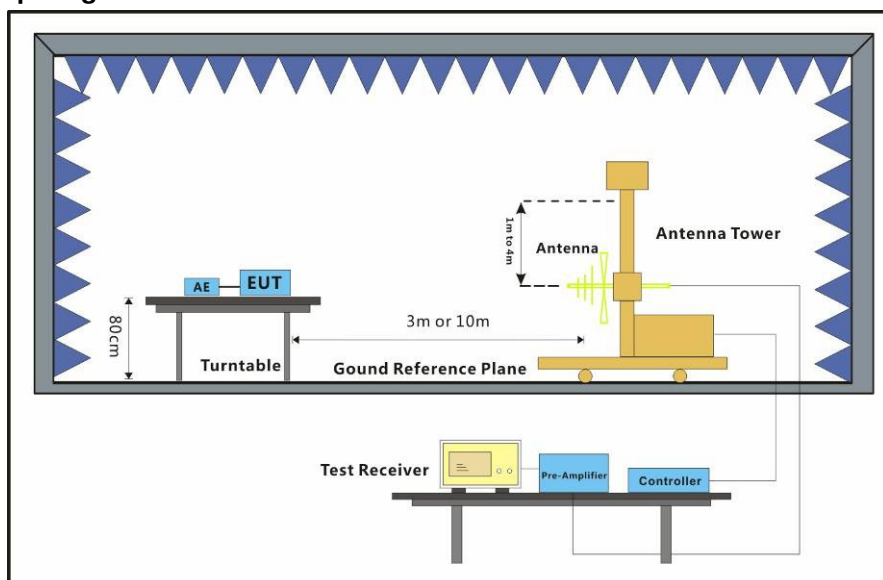
#### 6.3.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode a: keep EUT monitoring and data running continual .

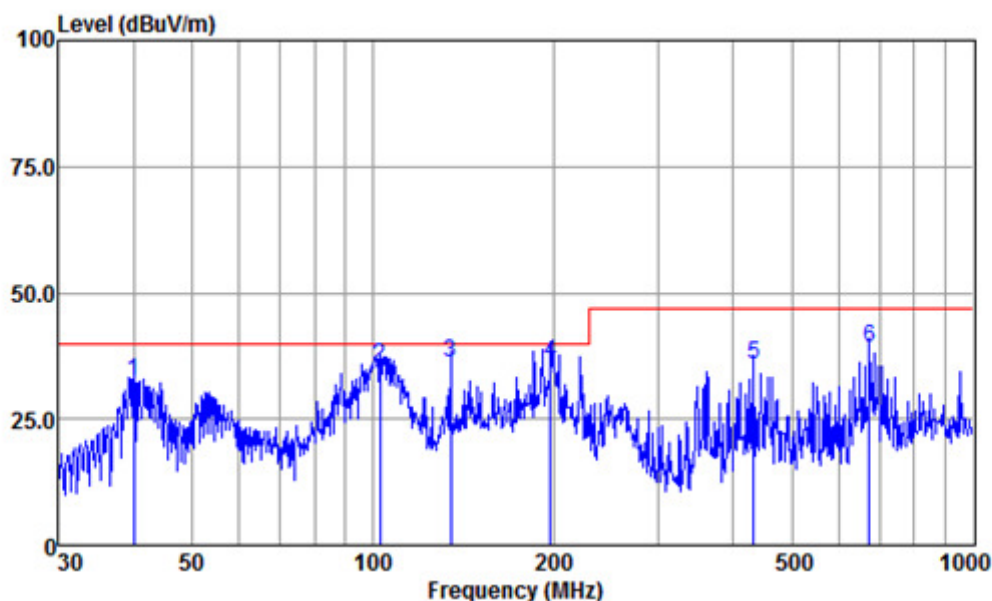
#### 6.3.2 Test Setup Diagram



#### 6.3.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

Mode:a; Polarization:Horizontal



Antenna Polarity :HORIZONTAL

EUT/Project :2003IT

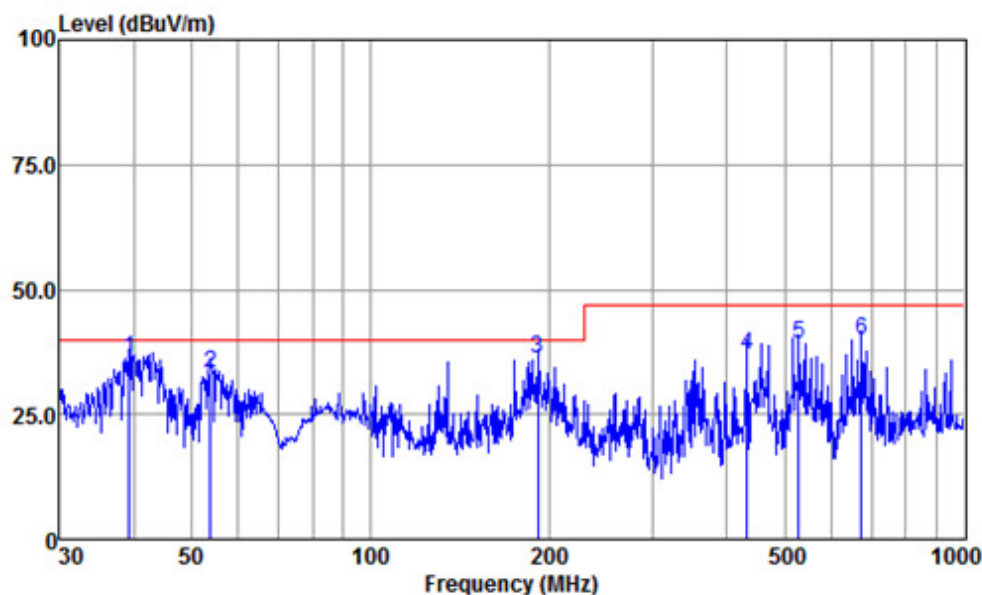
Test mode :a

|   | Freq   | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|--------|------------|----------------|------------|---------------|----------------|------------|------------|--------|
|   | MHz    | dBuV       | dB/m           | dB         | dB            | dBuV/m         | dBuV/m     | dB         |        |
| 1 | 39.99  | 58.70      | 16.30          | 0.22       | 42.62         | 32.60          | 40.00      | -7.40      | QP     |
| 2 | 103.08 | 68.20      | 9.53           | 0.47       | 42.69         | 35.51          | 40.00      | -4.49      | QP     |
| 3 | 135.03 | 66.22      | 12.01          | 0.60       | 42.64         | 36.19          | 40.00      | -3.81      | QP     |
| 4 | 197.89 | 68.30      | 9.58           | 0.69       | 42.53         | 36.04          | 40.00      | -3.96      | QP     |
| 5 | 432.55 | 61.01      | 15.83          | 1.06       | 42.11         | 35.79          | 47.00      | -11.21     | QP     |
| 6 | 672.84 | 59.84      | 20.00          | 1.58       | 42.32         | 39.10          | 47.00      | -7.90      | QP     |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



Mode:a; Polarization:Vertical



Antenna Polarity :VERTICAL

EUT/Project :2003IT

Test mode :a

|   | Freq   | Read Level | Antenna Factor | Cable Loss | Preamplifier Factor | Emission Level | Limit Line | Over Limit | Remark |
|---|--------|------------|----------------|------------|---------------------|----------------|------------|------------|--------|
|   | MHz    | dBuV       | dB/m           | dB         | dB                  | dBuV/m         | dBuV/m     | dB         |        |
| 1 | 39.30  | 62.14      | 16.24          | 0.22       | 42.62               | 35.98          | 40.00      | -4.02      | QP     |
| 2 | 53.88  | 64.22      | 11.41          | 0.27       | 42.65               | 33.25          | 40.00      | -6.75      | QP     |
| 3 | 191.75 | 67.79      | 10.12          | 0.68       | 42.54               | 36.05          | 40.00      | -3.95      | QP     |
| 4 | 432.55 | 62.13      | 15.83          | 1.06       | 42.11               | 36.91          | 47.00      | -10.09     | QP     |
| 5 | 528.25 | 62.04      | 17.88          | 1.23       | 42.16               | 38.99          | 47.00      | -8.01      | QP     |
| 6 | 672.84 | 60.62      | 20.00          | 1.58       | 42.32               | 39.88          | 47.00      | -7.12      | QP     |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamplifier Factor

## 6.4 Radiated Emissions (above 1GHz)

Test Requirement: EN 55032:2015

Test Method: EN 55032:2015

Frequency Range: Above 1GHz

Measurement Distance: 3m

Limit:

1GHz-3GHz 70 dB( $\mu$ V/m) peak, 50 dB( $\mu$ V/m) average

3GHz-6GHz 74 dB( $\mu$ V/m) peak, 54dB( $\mu$ V/m) average

Detector: Peak for pre-scan (1000kHz resolution bandwidth) 1000M to 6000MHz

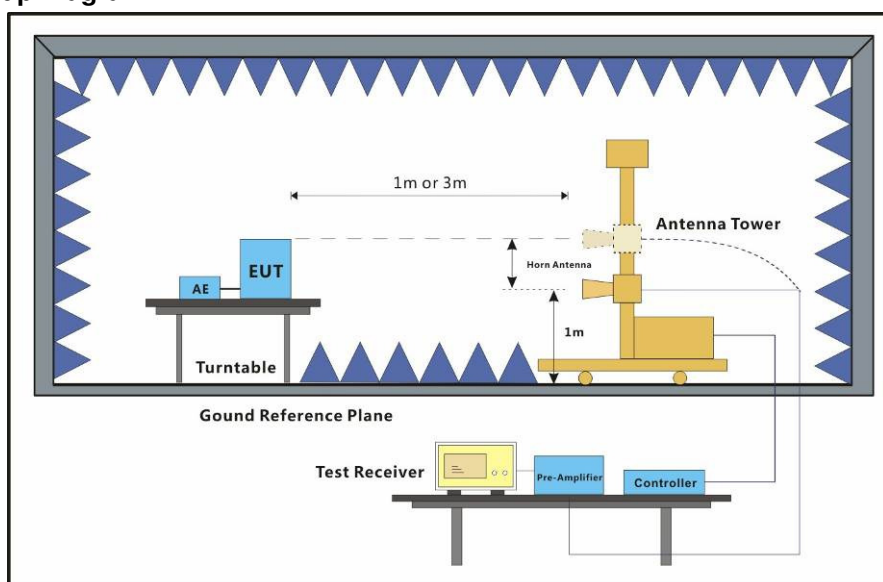
### 6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode a: keep EUT monitoring and data running continual .

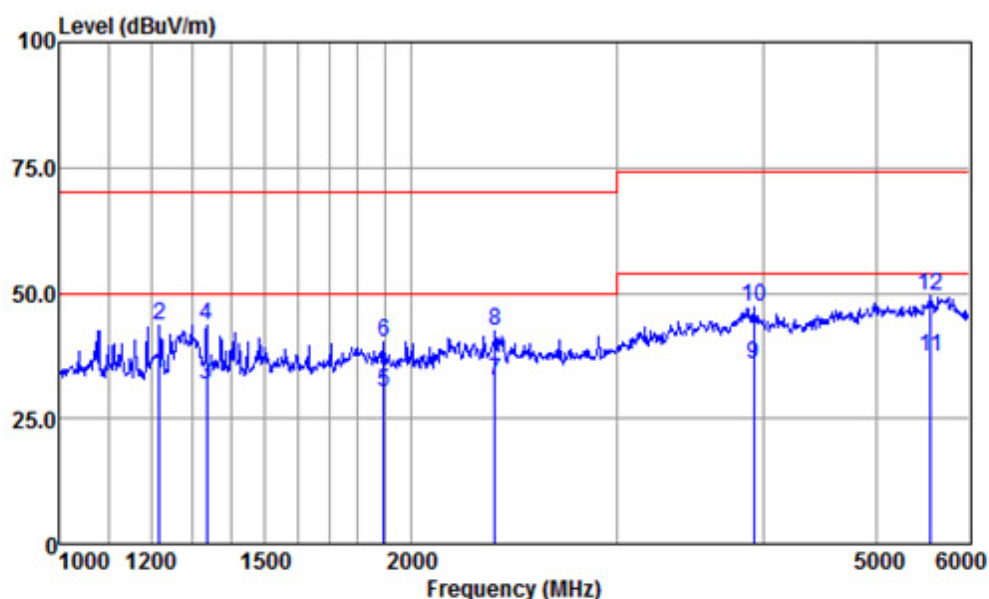
### 6.4.2 Test Setup Diagram



### 6.4.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

Mode:a; Polarization:Horizontal



Antenna Polarity :HORIZONTAL

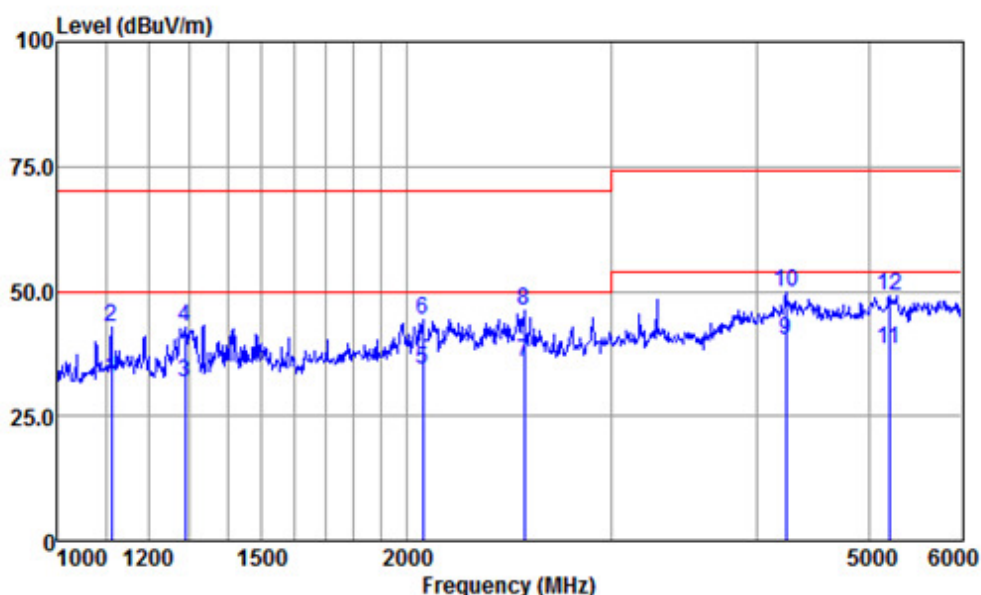
EUT/Project :2003IT

Test mode :a

|    | Freq    | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark  |
|----|---------|------------|----------------|------------|---------------|----------------|------------|------------|---------|
|    | MHz     | dBuv       | dB/m           | dB         | dB            | dBuv/m         | dBuv/m     | dB         |         |
| 1  | 1217.86 | 47.87      | 24.63          | 3.40       | 41.83         | 34.07          | 50.00      | -15.93     | Average |
| 2  | 1217.86 | 57.37      | 24.63          | 3.40       | 41.83         | 43.57          | 70.00      | -26.43     | Peak    |
| 3  | 1336.78 | 45.25      | 24.89          | 3.60       | 41.88         | 31.86          | 50.00      | -18.14     | Average |
| 4  | 1336.78 | 56.91      | 24.89          | 3.60       | 41.88         | 43.52          | 70.00      | -26.48     | Peak    |
| 5  | 1895.83 | 42.12      | 25.85          | 4.33       | 42.16         | 30.14          | 50.00      | -19.86     | Average |
| 6  | 1895.83 | 52.23      | 25.85          | 4.33       | 42.16         | 40.25          | 70.00      | -29.75     | Peak    |
| 7  | 2359.04 | 42.66      | 27.04          | 5.12       | 42.18         | 32.64          | 50.00      | -17.36     | Average |
| 8  | 2359.04 | 52.30      | 27.04          | 5.12       | 42.18         | 42.28          | 70.00      | -27.72     | Peak    |
| 9  | 3931.04 | 41.40      | 29.59          | 6.90       | 41.95         | 35.94          | 54.00      | -18.06     | Average |
| 10 | 3931.04 | 52.69      | 29.59          | 6.90       | 41.95         | 47.23          | 74.00      | -26.77     | Peak    |
| 11 | 5575.03 | 38.90      | 31.99          | 8.32       | 41.99         | 37.22          | 54.00      | -16.78     | Average |
| 12 | 5575.03 | 50.97      | 31.99          | 8.32       | 41.99         | 49.29          | 74.00      | -24.71     | Peak    |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Mode:a; Polarization:Vertical



Antenna Polarity :VERTICAL

EUT/Project :2003IT

Test mode :a

|    | Freq    | Read Level | Antenna Factor | Cable Loss | Preamp Factor | Emission Level | Limit Line | Over Limit | Remark  |
|----|---------|------------|----------------|------------|---------------|----------------|------------|------------|---------|
|    | MHz     | dBuV       | dB/m           | dB         | dB            | dBuV/m         | dBuV/m     | dB         |         |
| 1  | 1113.50 | 46.56      | 24.39          | 3.25       | 41.79         | 32.41          | 50.00      | -17.59     | Average |
| 2  | 1113.50 | 56.93      | 24.39          | 3.25       | 41.79         | 42.78          | 70.00      | -27.22     | Peak    |
| 3  | 1287.42 | 45.38      | 24.78          | 3.51       | 41.86         | 31.81          | 50.00      | -18.19     | Average |
| 4  | 1287.42 | 56.35      | 24.78          | 3.51       | 41.86         | 42.78          | 70.00      | -27.22     | Peak    |
| 5  | 2066.10 | 45.69      | 26.20          | 4.60       | 42.21         | 34.28          | 50.00      | -15.72     | Average |
| 6  | 2066.10 | 55.79      | 26.20          | 4.60       | 42.21         | 44.38          | 70.00      | -25.62     | Peak    |
| 7  | 2525.25 | 45.12      | 27.45          | 5.37       | 42.15         | 35.79          | 50.00      | -14.21     | Average |
| 8  | 2525.25 | 55.44      | 27.45          | 5.37       | 42.15         | 46.11          | 70.00      | -23.89     | Peak    |
| 9  | 4245.88 | 44.58      | 30.15          | 7.39       | 41.81         | 40.31          | 54.00      | -13.69     | Average |
| 10 | 4245.88 | 54.27      | 30.15          | 7.39       | 41.81         | 50.00          | 74.00      | -24.00     | Peak    |
| 11 | 5208.08 | 40.07      | 31.73          | 8.24       | 41.78         | 38.26          | 54.00      | -15.74     | Average |
| 12 | 5208.08 | 50.89      | 31.73          | 8.24       | 41.78         | 49.08          | 74.00      | -24.92     | Peak    |

Note:Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor



## 6.5 Harmonic Current Emission

Test Requirement: EN 61000-3-2:2014

Test Method: EN 61000-3-2:2014

Frequency Range: 100Hz to 2kHz

There is no need for Harmonics test to be performed on this product (rated power is less than 75W) in accordance with EN 61000-3-2:2014.

For further details, please refer to Clause 7 of EN 61000-3-2 which states:

"For the following categories of equipment, limits are not specified in this standard.- equipment with a rated power of 75W or less, other than lighting equipment."



## 6.6 Voltage Fluctuations and Flicker

Test Requirement: EN 61000-3-3:2013

Test Method: EN 61000-3-3:2013

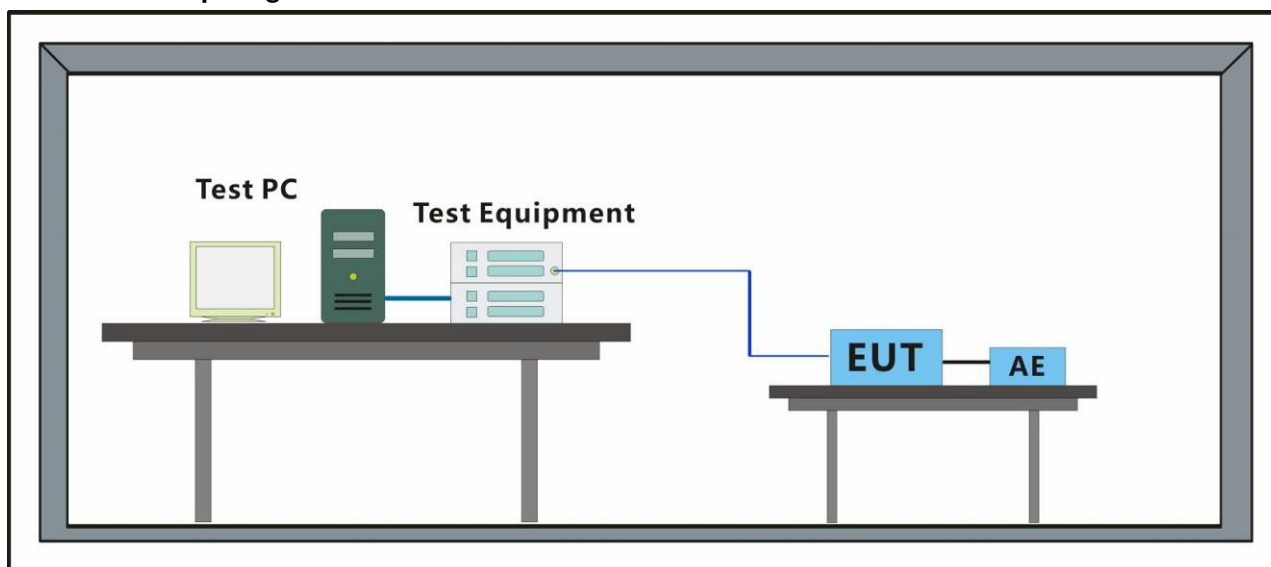
### 6.6.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar

Test mode a: keep EUT monitoring and data running continual .

### 6.6.2 Test Setup Diagram



### 6.6.3 Measurement Data

Mode:a

Vrms at the end of test (Volt): 229.81  
T-max (mS): 0  
Highest dc (%): 0.48  
Highest dmax (%): 0.61  
Highest Pst (10 min. period): 0.247  
Highest Plt (2 hr. period): 0.107

Test limit (mS): 500.0 Pass  
Test limit (%): 3.30 Pass  
Test limit (%): 4.00 Pass  
Test limit: 1.000 Pass  
Test limit: 0.650 Pass

## 7 Immunity Test Results

### 7.1 Performance Criteria Description in EN 55024:2010 +A1:2015

- Criterion A** 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. 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.
- Criterion B** 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 phenomena 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.
- During the test, degradation of performance is allowed. However, no change of operating state or stored data is 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.
- Criterion C** 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.
- Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.

### 7.2 Performance Criteria Description in EN 50130-4:2011 +A1:2014

There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the application of the discharges is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

For further details, please refer to Clause 7.4, 8.4, 9.4, 10.4, 11.4, 12.4 and 13.4, of EN 50130-4.

### 7.3 Performance Criteria Description in EN 55035:2017

#### Criterion A

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. 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.

#### Criterion B

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 phenomena 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.

During the test, degradation of performance is allowed. However, no change of operating state or stored data is 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.

#### Criterion C

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.

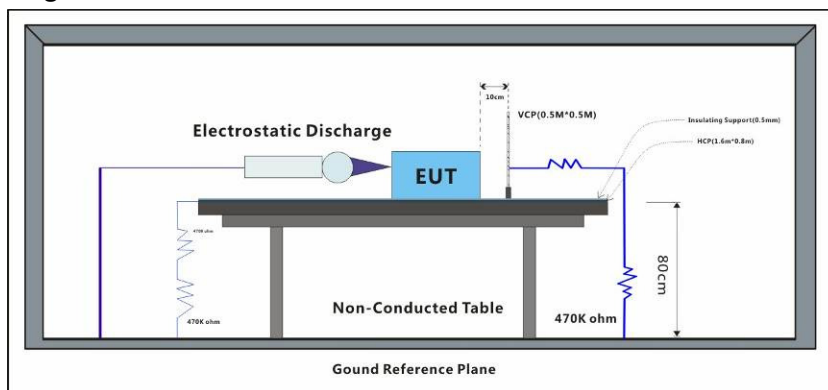
Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.



## 7.4 Electrostatic Discharge

Test Requirement: EN 55024:2010 +A1:2015  
 Test Method: EN 61000-4-2:2009  
 Performance Criterion: B  
 Discharge Impedance: 330Ω/150pF  
 Number of Discharge: Minimum of four test points (a minimum of 50 discharges at each point)  
 Discharge Mode: Single Discharge  
 Discharge Period: 1 second minimum

### 7.4.1 Test Setup Diagram



### 7.4.2 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity: 51 % RH Atmospheric Pressure: 1020 mbar  
 Test mode: a: keep EUT monitoring and data running continual .

### 7.4.3 Test Results:

Observations: Test Point:  
 1. All insulated enclosure and seams.  
 2. All accessible metal parts of the enclosure.  
 3. All side

| Discharge type      | Level (kV) | Polarity | Test Point | Result / Observations |
|---------------------|------------|----------|------------|-----------------------|
| Air Discharge       | 2,4,8      | +        | 1          | A                     |
| Air Discharge       | 2,4,8      | -        | 1          | A                     |
| Contact Discharge   | 4          | +        | 2          | A                     |
| Contact Discharge   | 4          | -        | 2          | A                     |
| Horizontal Coupling | 4          | +        | 3          | A                     |
| Horizontal Coupling | 4          | -        | 3          | A                     |
| Vertical Coupling   | 4          | +        | 3          | A                     |
| Vertical Coupling   | 4          | -        | 3          | A                     |

### Results:

A: No degradation in the performance of the EUT was observed.

## 7.5 Electrostatic Discharge

Test Requirement: EN 50130-4:2011 +A1:2014

Test Method: EN 61000-4-2:2009

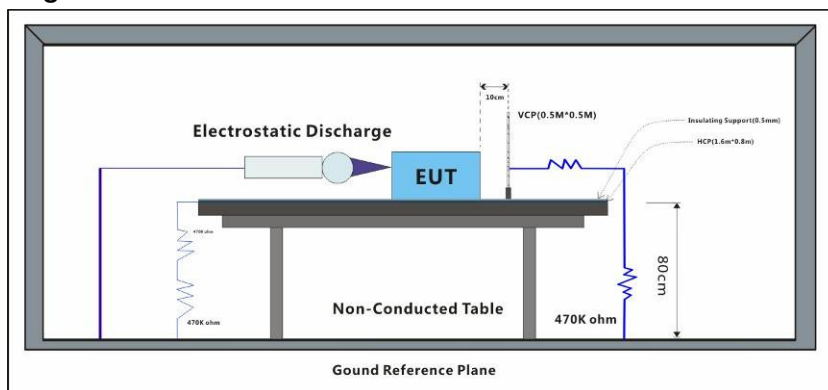
Number of Discharge: Minimum 10 times at each test point for Air Discharge  
Minimum 50 times at each test point for Contact or VCP & HCP Discharge

Discharge Mode: Single Discharge

Discharge Period: 1 second minimum

Criteria for compliance: There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the application of the discharges is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as

### 7.5.1 Test Setup Diagram



### 7.5.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 51 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: keep EUT monitoring and data running continual .

### 7.5.3 Test Results:

Observations: Test Point:

1. All insulated enclosure and seams.
2. All accessible metal parts of the enclosure.
3. All side

| Discharge type      | Level (kV) | Polarity | Test Point | Result / Observations |
|---------------------|------------|----------|------------|-----------------------|
| Air Discharge       | 2,4,8      | +        | 1          | A                     |
| Air Discharge       | 2,4,8      | -        | 1          | A                     |
| Contact Discharge   | 6          | +        | 2          | A                     |
| Contact Discharge   | 6          | -        | 2          | A                     |
| Horizontal Coupling | 6          | +        | 3          | A                     |
| Horizontal Coupling | 6          | -        | 3          | A                     |
| Vertical Coupling   | 6          | +        | 3          | A                     |
| Vertical Coupling   | 6          | -        | 3          | A                     |

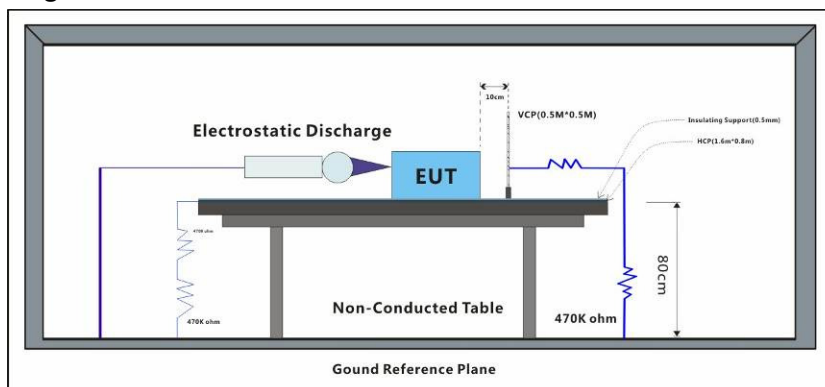
### Results:

A: No degradation in the performance of the EUT was observed.

## 7.6 Electrostatic Discharge

Test Requirement: EN 55035:2017  
 Test Method: EN 61000-4-2:2009  
 Performance Criterion: B  
 Discharge Impedance: 330Ω/150pF  
 Number of Discharge: Minimum 10 times at each test point  
 Discharge Mode: Single Discharge  
 Discharge Period: 1 second minimum

### 7.6.1 Test Setup Diagram



### 7.6.2 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity: 51 % RH Atmospheric Pressure: 1002 mbar  
 Test mode: a: keep EUT monitoring and data running continual .

### 7.6.3 Test Results:

Observations: Test Point:  
 1. All insulated enclosure and seams.  
 2. All accessible metal parts of the enclosure.  
 3. All side

| Discharge type      | Level (kV) | Polarity | Test Point | Result / Observations |
|---------------------|------------|----------|------------|-----------------------|
| Air Discharge       | 2,4,8      | +        | 1          | A                     |
| Air Discharge       | 2,4,8      | -        | 1          | A                     |
| Contact Discharge   | 4          | +        | 2          | A                     |
| Contact Discharge   | 4          | -        | 2          | A                     |
| Horizontal Coupling | 4          | +        | 3          | A                     |
| Horizontal Coupling | 4          | -        | 3          | A                     |
| Vertical Coupling   | 4          | +        | 3          | A                     |
| Vertical Coupling   | 4          | -        | 3          | A                     |

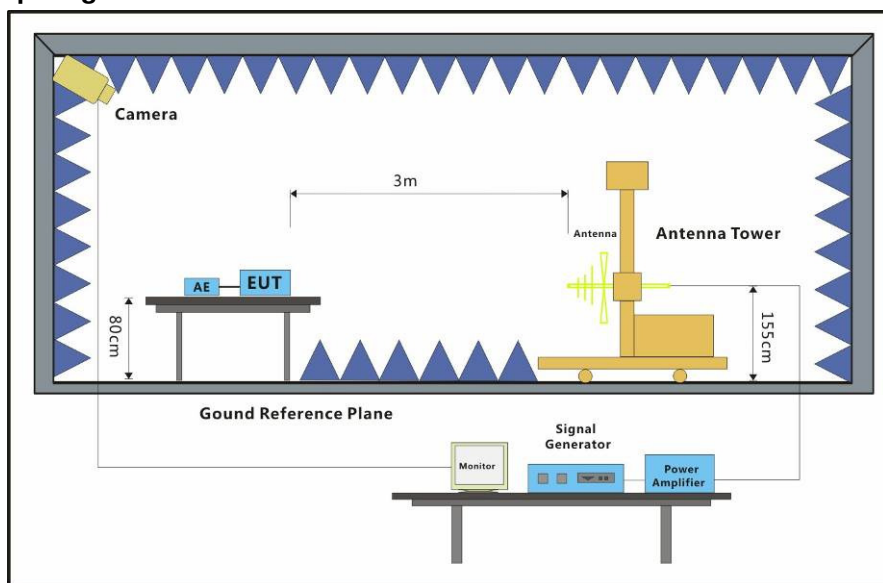
### Results:

A: No degradation in the performance of the EUT was observed.

## 7.7 Radiated Immunity (80MHz-1GHz,1800MHz,2600MHz,3500MHz,5000MHz)

Test Requirement: EN 55035:2017  
 Test Method: EN 61000-4-3:2006 +A1:2008+A2:2010  
 Performance Criterion: A  
 Frequency Range: 80MHz to 1GHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz  
 Antenna Polarisation: Vertical and Horizontal  
 Modulation: 1kHz,80% Amp. Mod,1% increment

### 7.7.1 Test Setup Diagram



### 7.7.2 E.U.T. Operation

Operating Environment:

Temperature: 21 °C Humidity: 49 % RH Atmospheric Pressure: 1002 mbar

Test mode: a: keep EUT monitoring and data running continual .

### 7.7.3 Test Results:

| Frequency  | Level (V/m) | EUT Face  | Dwell time | Result / Observations |
|------------|-------------|-----------|------------|-----------------------|
| 80MHz-1GHz | 3           | Front     | 3s         | A                     |
| 80MHz-1GHz | 3           | Back      | 3s         | A                     |
| 80MHz-1GHz | 3           | Left      | 3s         | A                     |
| 80MHz-1GHz | 3           | Right     | 3s         | A                     |
| 80MHz-1GHz | 3           | Top       | 3s         | A                     |
| 80MHz-1GHz | 3           | Underside | 3s         | A                     |
| 1800MHz    | 3           | Front     | 3s         | A                     |
| 1800MHz    | 3           | Back      | 3s         | A                     |
| 1800MHz    | 3           | Left      | 3s         | A                     |
| 1800MHz    | 3           | Right     | 3s         | A                     |
| 1800MHz    | 3           | Top       | 3s         | A                     |
| 1800MHz    | 3           | Underside | 3s         | A                     |
| 2600MHz    | 3           | Front     | 3s         | A                     |
| 2600MHz    | 3           | Back      | 3s         | A                     |
| 2600MHz    | 3           | Left      | 3s         | A                     |



|         |   |           |    |   |
|---------|---|-----------|----|---|
| 2600MHz | 3 | Right     | 3s | A |
| 2600MHz | 3 | Top       | 3s | A |
| 2600MHz | 3 | Underside | 3s | A |
| 3500MHz | 3 | Front     | 3s | A |
| 3500MHz | 3 | Back      | 3s | A |
| 3500MHz | 3 | Left      | 3s | A |
| 3500MHz | 3 | Right     | 3s | A |
| 3500MHz | 3 | Top       | 3s | A |
| 3500MHz | 3 | Underside | 3s | A |
| 5000MHz | 3 | Front     | 3s | A |
| 5000MHz | 3 | Back      | 3s | A |
| 5000MHz | 3 | Left      | 3s | A |
| 5000MHz | 3 | Right     | 3s | A |
| 5000MHz | 3 | Top       | 3s | A |
| 5000MHz | 3 | Underside | 3s | A |

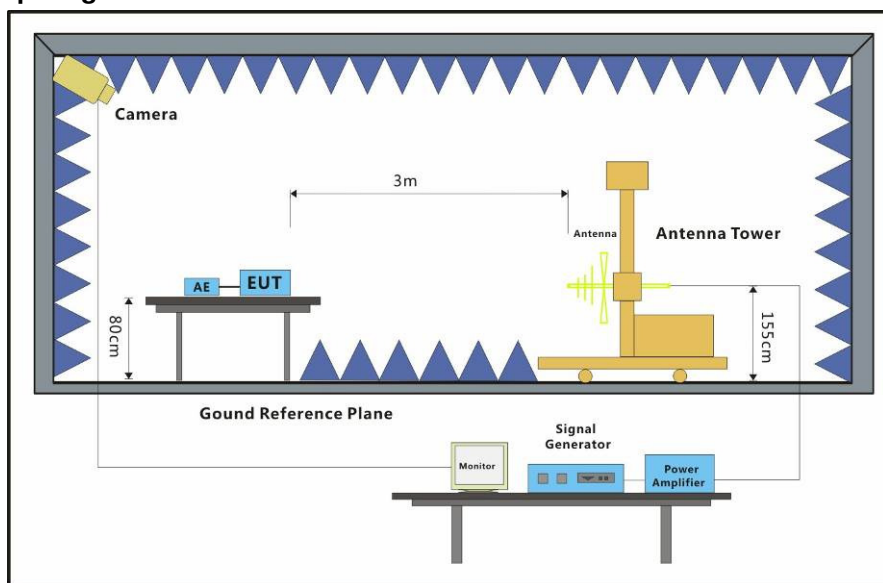
**Results:**

A: No degradation in the performance of the EUT was observed.

## 7.8 Radiated Immunity (80MHz-1GHz)

Test Requirement: EN 55024:2010 +A1:2015  
 Test Method: EN 61000-4-3:2006 +A1:2008+A2:2010  
 Performance Criterion: A  
 Frequency Range: 80MHz to 1GHz  
 Antenna Polarisation: Vertical and Horizontal  
 Modulation: 1kHz,80% Amp. Mod,1% increment

### 7.8.1 Test Setup Diagram



### 7.8.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: keep EUT monitoring and data running continual .

### 7.8.3 Test Results:

| Frequency  | Level (V/m) | EUT Face | Dwell time | Result / Observations |
|------------|-------------|----------|------------|-----------------------|
| 80MHz-1GHz | 3           | Front    | 3s         | A                     |
| 80MHz-1GHz | 3           | Back     | 3s         | A                     |
| 80MHz-1GHz | 3           | Left     | 3s         | A                     |
| 80MHz-1GHz | 3           | Right    | 3s         | A                     |

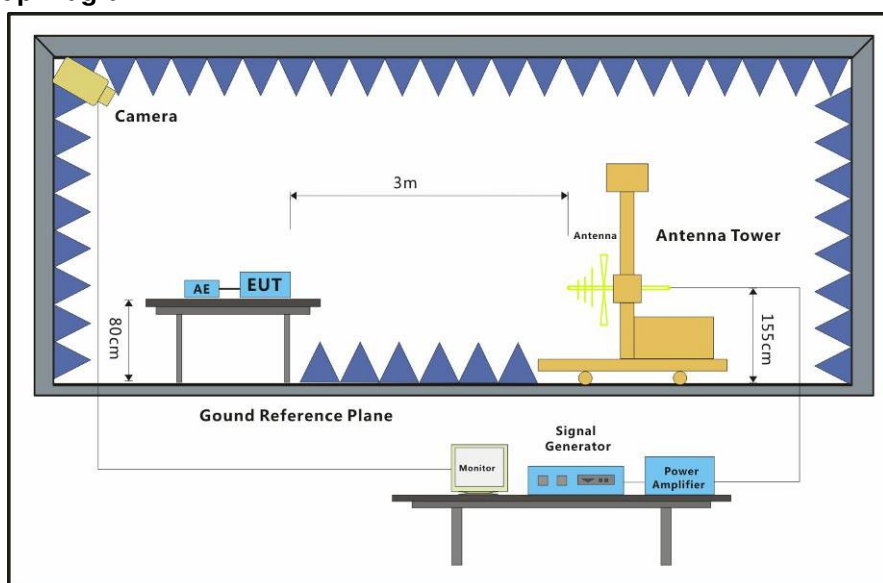
### Results:

A: No degradation in the performance of the EUT was observed.

## 7.9 Radiated Immunity(80MHz-2.7GHz)

Test Requirement: EN 50130-4:2011 +A1:2014  
 Test Method: EN 61000-4-3:2006 +A1:2008+A2:2010  
 Modulation: 80%, 1 kHz Amplitude Modulation & 0.5s ON 0.5s OFF Pulse Modulation  
 Criteria for compliance: There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no

### 7.9.1 Test Setup Diagram



### 7.9.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: keep EUT monitoring and data running continual .

### 7.9.3 Test Results:

| Frequency    | Level (V/m) | EUT Face | Dwell time | Result / Observations |
|--------------|-------------|----------|------------|-----------------------|
| 80MHz-2.7GHz | 10          | Front    | 3s         | A                     |
| 80MHz-2.7GHz | 10          | Back     | 3s         | A                     |
| 80MHz-2.7GHz | 10          | Left     | 3s         | A                     |
| 80MHz-2.7GHz | 10          | Right    | 3s         | A                     |

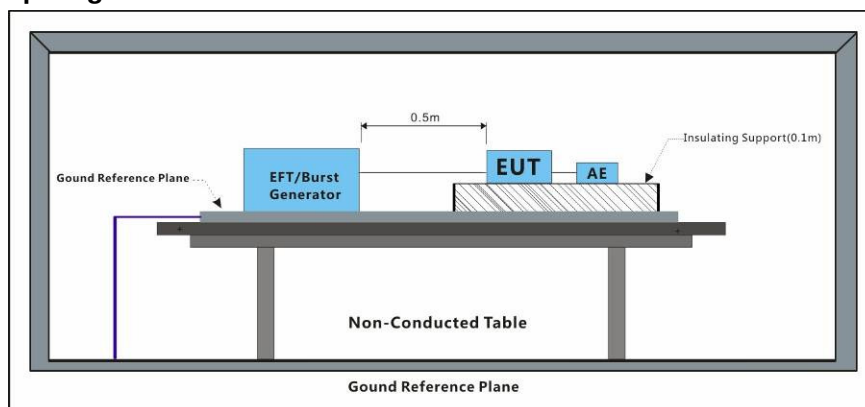
### Results:

A: No degradation in the performance of the EUT was observed.

## 7.10 Electrical Fast Transients/Burst at Power Port

Test Requirement: EN 55024:2010 +A1:2015  
 Test Method: EN 61000-4-4:2012  
 Performance Criterion: B  
 Repetition Frequency: 5kHz  
 Burst Period: 300ms  
 Test Duration: 2 minute per level & polarity

### 7.10.1 Test Setup Diagram



### 7.10.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 51 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: keep EUT monitoring and data running continual .

### 7.10.3 Test Results:

| Test Line     | Level (kV) | Polarity | CDN/Clamp | Result / Observations |
|---------------|------------|----------|-----------|-----------------------|
| AC power port | 1          | +        | CDN       | A                     |
| AC power port | 1          | -        | CDN       | A                     |

#### Results:

A: No degradation in the performance of the EUT was observed.



## 7.11 Electrical Fast Transients/Burst at Power Port

Test Requirement: EN 50130-4:2011 +A1:2014

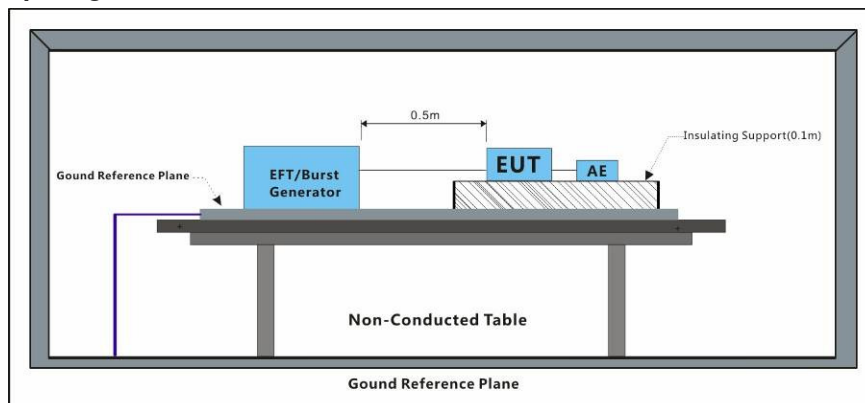
Test Method: EN 61000-4-4:2012

Repetition Frequency: 100kHz

Burst Period: 300ms

Test Duration: 1 minute per level & polarity

### 7.11.1 Test Setup Diagram



### 7.11.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 51 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: keep EUT monitoring and data running continual .

### 7.11.3 Test Results:

| Test Line     | Level (kV) | Polarity | CDN/Clamp | Result / Observations |
|---------------|------------|----------|-----------|-----------------------|
| AC power port | 2          | +        | CDN       | A                     |
| AC power port | 2          | -        | CDN       | A                     |

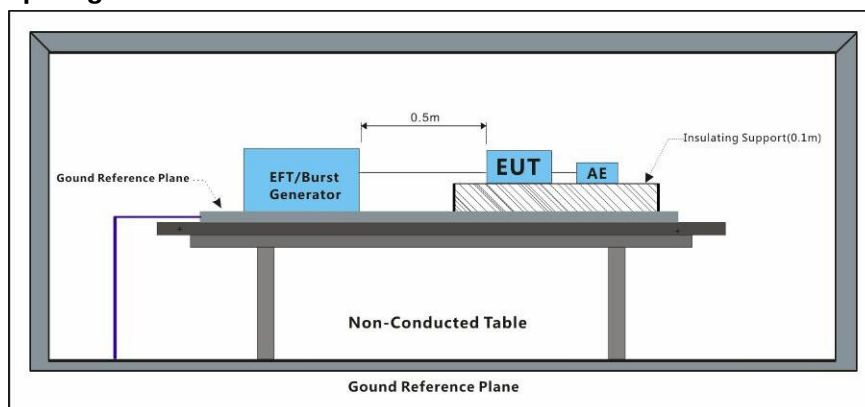
#### Results:

A: No degradation in the performance of the EUT was observed.

## 7.12 Electrical Fast Transients/Burst at Power Port

Test Requirement: EN 55035:2017  
 Test Method: EN 61000-4-4:2012  
 Performance Criterion: B  
 Repetition Frequency: 5kHz  
 Burst Period: 300ms  
 Test Duration: 2 minute per level & polarity

### 7.12.1 Test Setup Diagram



### 7.12.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 51 % RH Atmospheric Pressure: 1002 mbar

Test mode: a: keep EUT monitoring and data running continual .

### 7.12.3 Test Results:

| Test Line     | Level (kV) | Polarity | CDN/Clamp | Result / Observations |
|---------------|------------|----------|-----------|-----------------------|
| AC power port | 1          | +        | CDN       | A                     |
| AC power port | 1          | -        | CDN       | A                     |

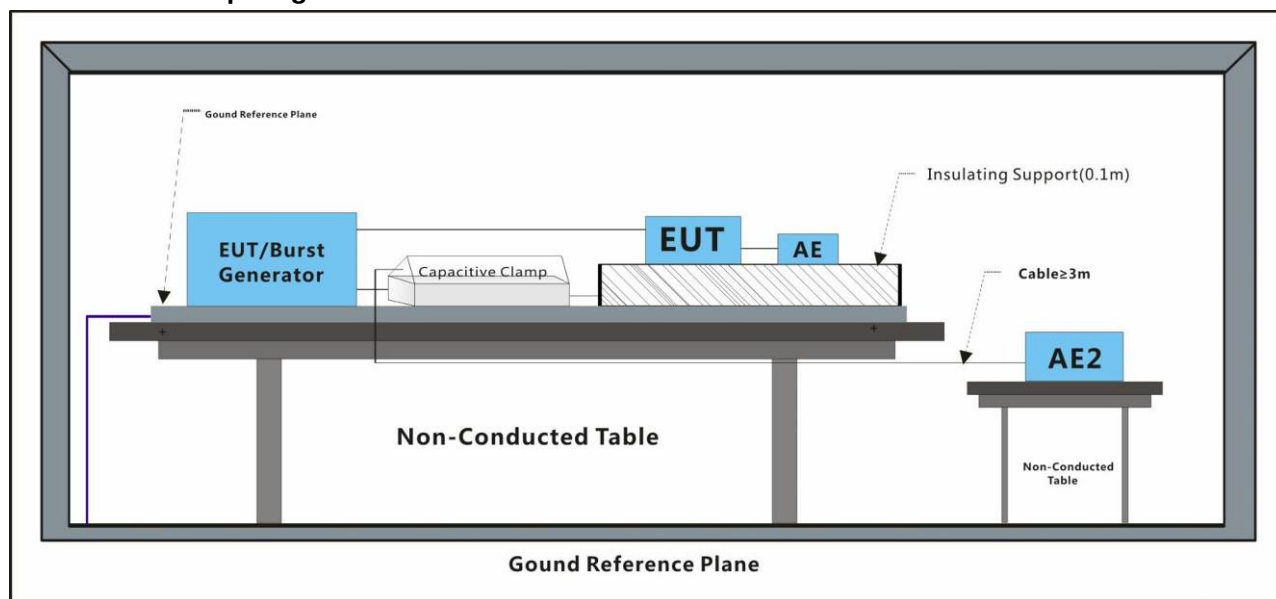
#### Results:

A: No degradation in the performance of the EUT was observed.

### 7.13 Electrical Fast Transients/Burst at Signal Port

Test Requirement: EN 55024:2010 +A1:2015  
 Test Method: EN 61000-4-4:2012  
 Performance Criterion: B  
 Repetition Frequency: 5kHz  
 Burst Period: 300ms  
 Test Duration: 2 minute per level & polarity

#### 7.13.1 Test Setup Diagram



#### 7.13.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 51 % RH Atmospheric Pressure: 1020 mbar  
 Test mode: a: keep EUT monitoring and data running continual .

#### 7.13.3 Test Results:

| Port        | Level (kV) | Polarity | CDN/Clamp | Result / Observations |
|-------------|------------|----------|-----------|-----------------------|
| Signal port | 0.5        | +        | Clamp     | A                     |
| Signal port | 0.5        | -        | Clamp     | A                     |

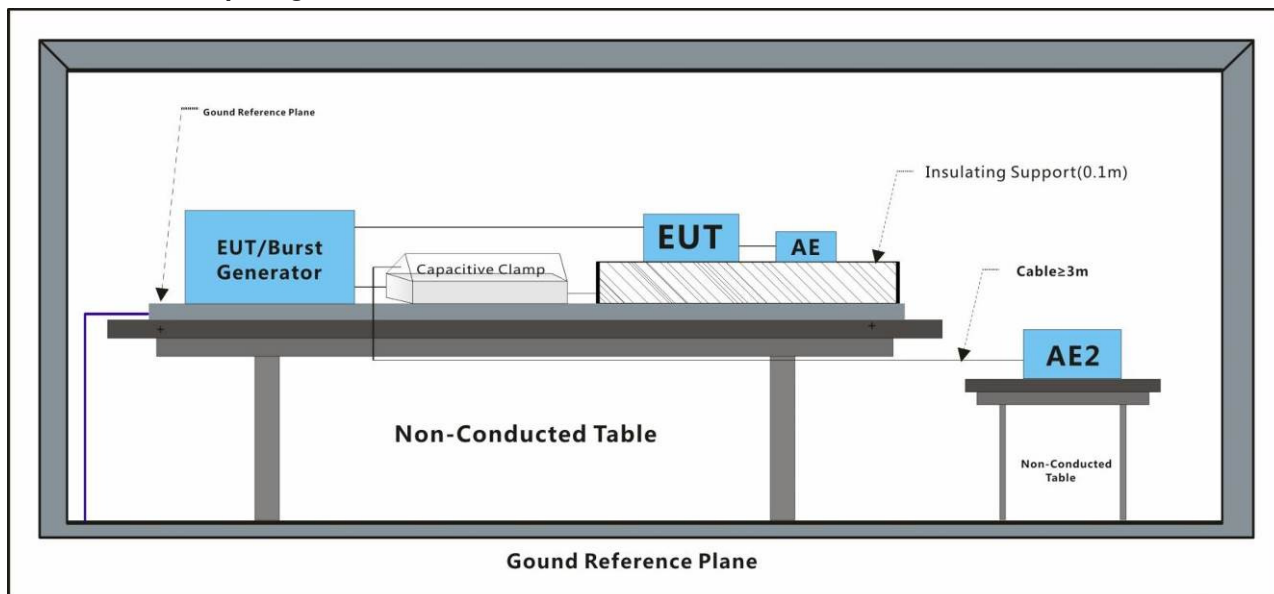
#### Results:

A: No degradation in the performance of the EUT was observed.

## 7.14 Electrical Fast Transients/Burst at Signal Port

Test Requirement: EN 50130-4:2011 +A1:2014  
 Test Method: EN 61000-4-4:2012  
 Repetition Frequency: 100kHz  
 Burst Period: 300ms  
 Test Duration: 1 minute per level & polarity

### 7.14.1 Test Setup Diagram



### 7.14.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 51 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: keep EUT monitoring and data running continual.

### 7.14.3 Test Results:

| Port        | Level (kV) | Polarity | CDN/Clamp | Result / Observations |
|-------------|------------|----------|-----------|-----------------------|
| Signal port | 1          | +        | Clamp     | A                     |
| Signal port | 1          | -        | Clamp     | A                     |

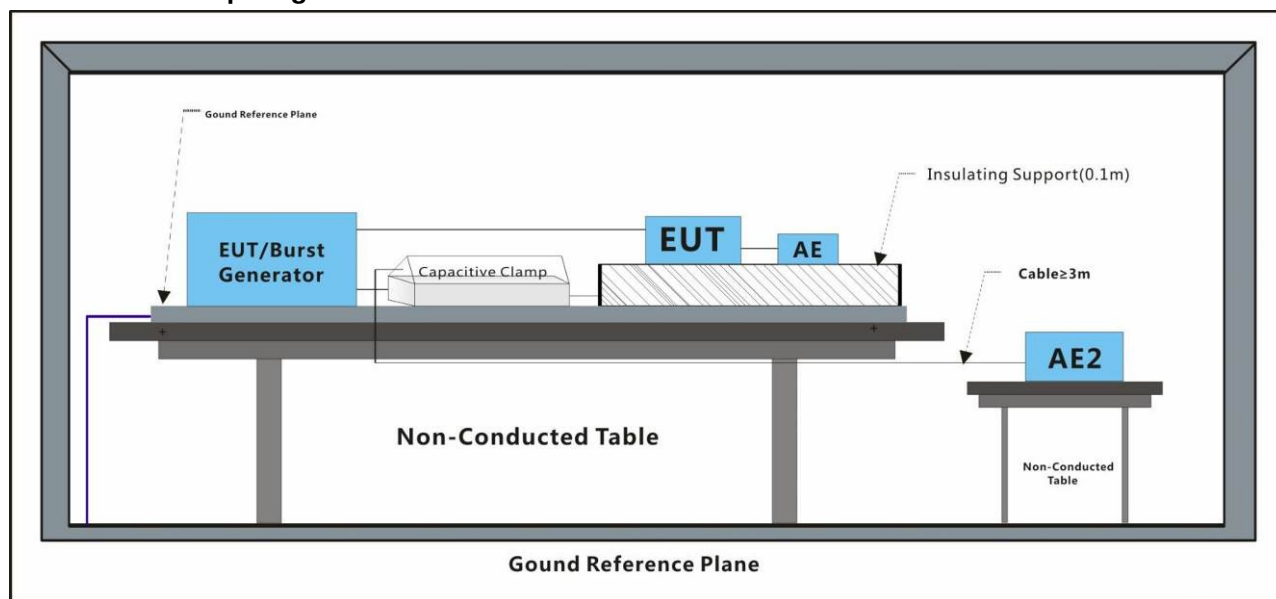
#### Results:

A: No degradation in the performance of the EUT was observed.

## 7.15 Electrical Fast Transients/Burst at Signal Port

Test Requirement: EN 55035:2017  
 Test Method: EN 61000-4-4:2012  
 Performance Criterion: B  
 Repetition Frequency: 5kHz  
 Burst Period: 300ms  
 Test Duration: 2 minute per level & polarity

### 7.15.1 Test Setup Diagram



### 7.15.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 52 % RH Atmospheric Pressure: 1002 mbar

Test mode: a: keep EUT monitoring and data running continual .

### 7.15.3 Test Results:

| Port        | Level (kV) | Polarity | CDN/Clamp | Result / Observations |
|-------------|------------|----------|-----------|-----------------------|
| Signal port | 0.5        | +        | Clamp     | A                     |
| Signal port | 0.5        | -        | Clamp     | A                     |

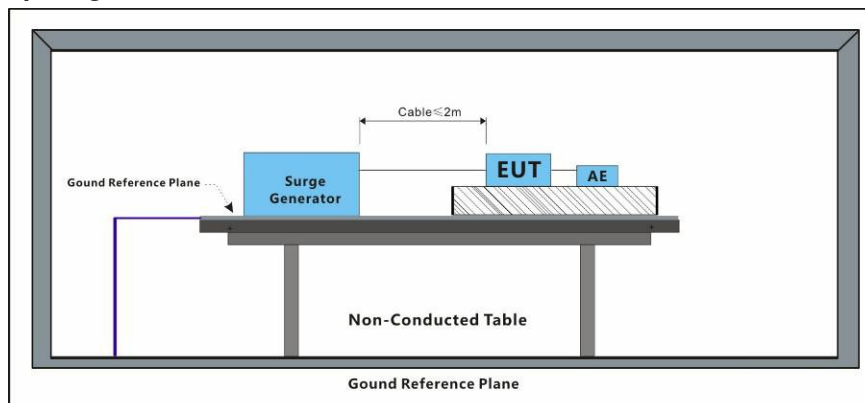
#### Results:

A: No degradation in the performance of the EUT was observed.

## 7.16 Surge at Power Port

Test Requirement: EN 55024:2010 +A1:2015  
 Test Method: EN 61000-4-5:2014  
 Performance Criterion: B  
 Interval: 60s between each surge  
 No. of surges: 5 positive, 5 negative at 0°, 90°, 180°, 270°.

### 7.16.1 Test Setup Diagram



### 7.16.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 51 % RH Atmospheric Pressure: 1020 mbar  
 Test mode: a: keep EUT monitoring and data running continual .

### 7.16.3 Test Results:

| Test Line | Level (kV) | Polarity | Phase (deg) | Result / Observations |
|-----------|------------|----------|-------------|-----------------------|
| L-N       | 1          | +        | 0°          | A                     |
| L-N       | 1          | -        | 0°          | A                     |
| L-N       | 1          | +        | 90°         | A                     |
| L-N       | 1          | -        | 90°         | A                     |
| L-N       | 1          | +        | 180°        | A                     |
| L-N       | 1          | -        | 180°        | A                     |
| L-N       | 1          | +        | 270°        | A                     |
| L-N       | 1          | -        | 270°        | A                     |

### Results:

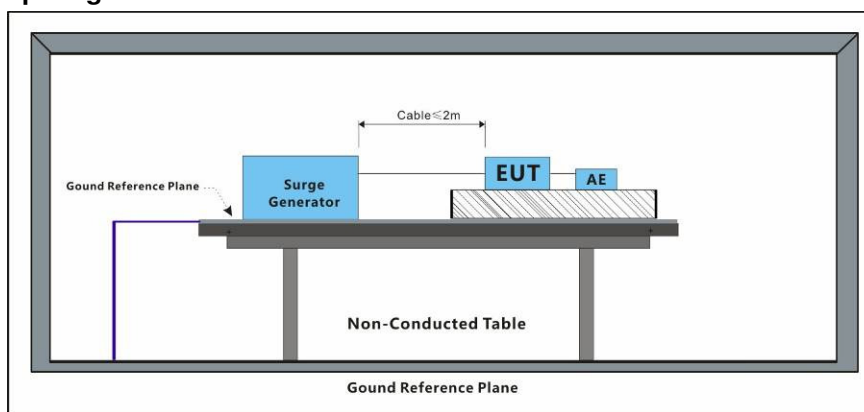
A: No degradation in the performance of the EUT was observed.



## 7.17 Surge at Power Port

|                          |  |
|--------------------------|--|
| Test Requirement:        | EN 50130-4:2011 +A1:2014   |
| Test Method:             | EN 61000-4-5:2014  |
| Interval:                | 60s between each surge   |
| No. of surges:           | 5 positive, 5 negative   |
| Criteria for compliance: | There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the application of the discharges is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as |

### 7.17.1 Test Setup Diagram



### 7.17.2 E.U.T. Operation

|                        |   |           |         |                       |           |
|------------------------|---|-----------|---------|-----------------------|-----------|
| Operating Environment: |   |           |         |                       |           |
| Temperature:           | 22 °C   | Humidity: | 51 % RH | Atmospheric Pressure: | 1020 mbar |
| Test mode:             | a: keep EUT monitoring and data running continual . |           |         |                       |           |

### 7.17.3 Test Results:

| Test Line | Level (kV) | Polarity | Phase (deg) | Result / Observations |
|-----------|------------|----------|-------------|-----------------------|
| L-N       | 0.5,1      | +        | 0°          | A                     |
| L-N       | 0.5,1      | -        | 0°          | A                     |
| L-N       | 0.5,1      | +        | 90°         | A                     |
| L-N       | 0.5,1      | -        | 90°         | A                     |
| L-N       | 0.5,1      | +        | 180°        | A                     |
| L-N       | 0.5,1      | -        | 180°        | A                     |
| L-N       | 0.5,1      | +        | 270°        | A                     |
| L-N       | 0.5,1      | -        | 270°        | A                     |

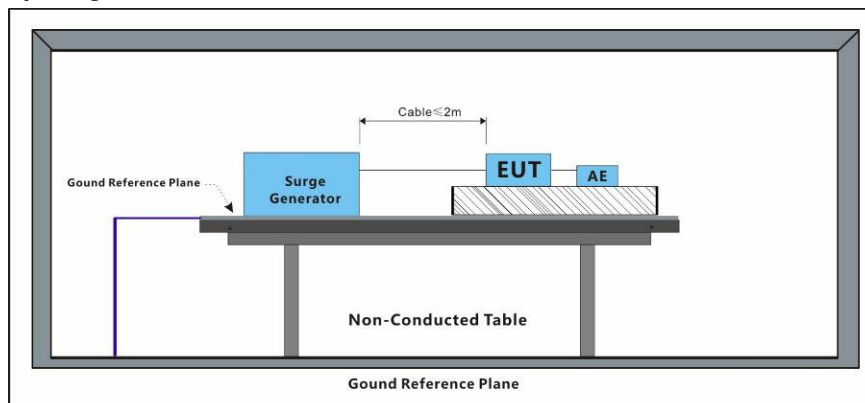
#### Results:

A: No degradation in the performance of the EUT was observed.

## 7.18 Surge at Power Port

Test Requirement: EN 55035:2017  
 Test Method: EN 61000-4-5:2014  
 Performance Criterion: B  
 Interval: 60s between each surge  
 No. of surges: 5 positive, 5 negative at 90°, 270°

### 7.18.1 Test Setup Diagram



### 7.18.2 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 51 % RH Atmospheric Pressure: 1002 mbar  
 Test mode: a: keep EUT monitoring and data running continual .

### 7.18.3 Test Results:

| Test Line | Level (kV) | Polarity | Phase (deg) | Result / Observations |
|-----------|------------|----------|-------------|-----------------------|
| L-N       | 1          | +        | 0°          | A                     |
| L-N       | 1          | -        | 0°          | A                     |
| L-N       | 1          | +        | 90°         | A                     |
| L-N       | 1          | -        | 90°         | A                     |
| L-N       | 1          | +        | 180°        | A                     |
| L-N       | 1          | -        | 180°        | A                     |
| L-N       | 1          | +        | 270°        | A                     |
| L-N       | 1          | -        | 270°        | A                     |

### Results:

A: No degradation in the performance of the EUT was observed.

## 7.19 Surge at Signal Port

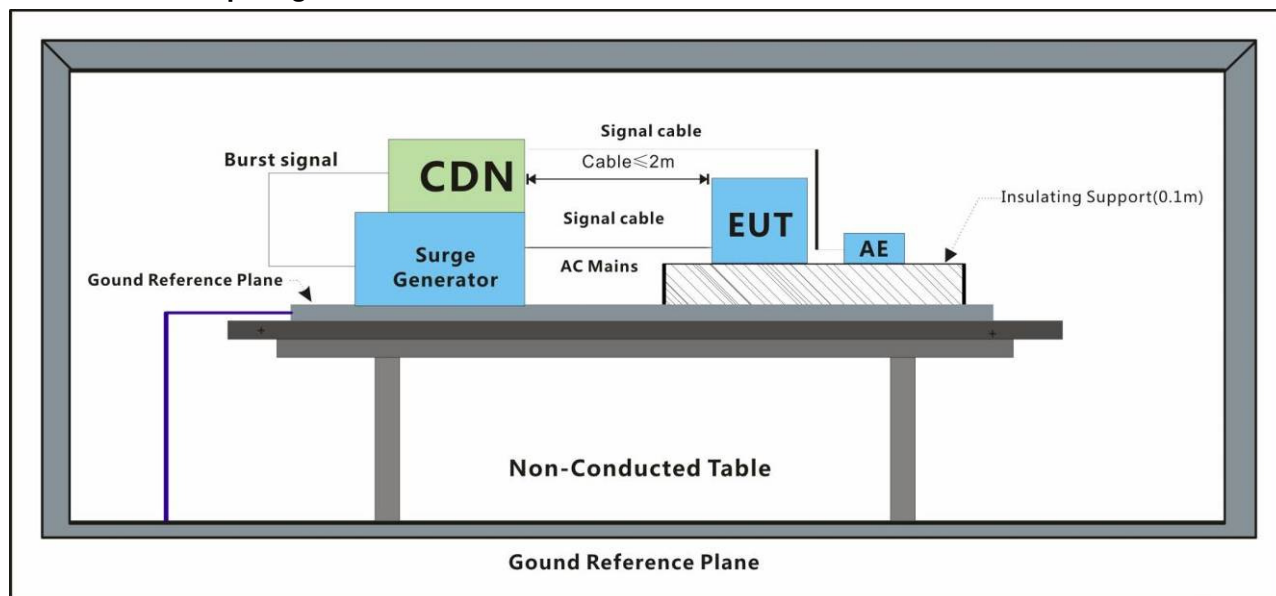
Test Requirement: EN 55024:2010 +A1:2015

Test Method: EN 61000-4-5:2014

Performance Criterion: B

Interval: 60s between each surge

### 7.19.1 Test Setup Diagram



### 7.19.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 51 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: keep EUT monitoring and data running continual .

### 7.19.3 Test Results:

| Port        | Line        | Level (kV) | Polarity | Result / Observations |
|-------------|-------------|------------|----------|-----------------------|
| Signal port | Line-Ground | 1          | +        | A                     |
| Signal port | Line-Ground | 1          | -        | A                     |

#### Results:

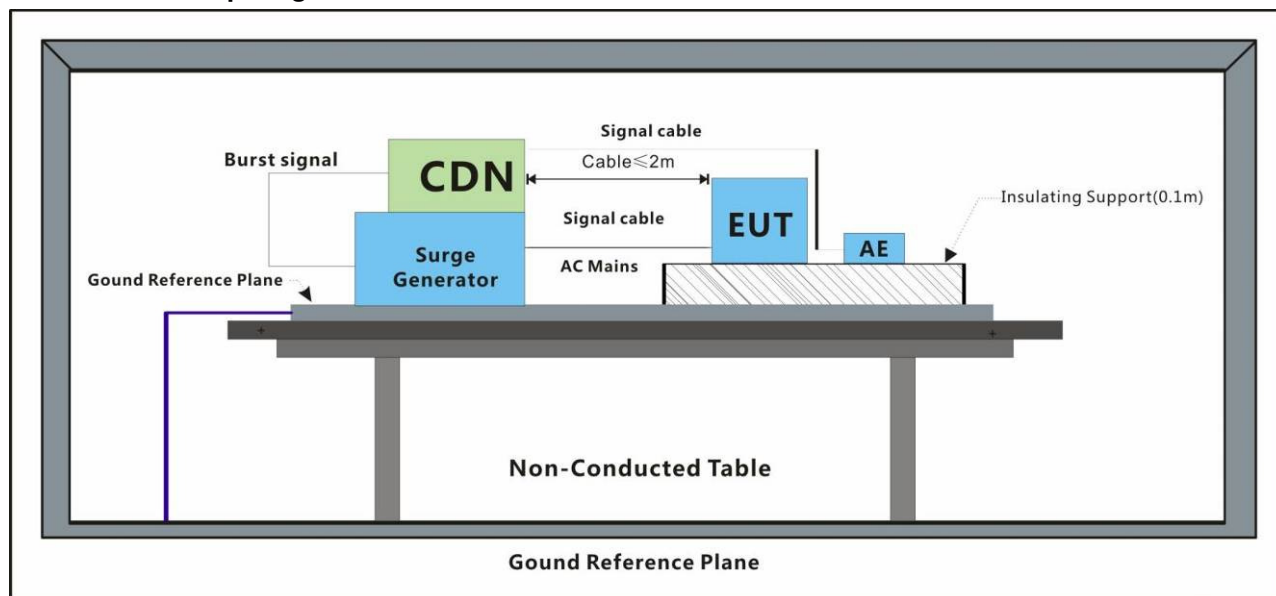
A: No degradation in the performance of the EUT was observed.

## 7.20 Surge at Signal Port

Test Requirement: EN 50130-4:2011 +A1:2014

Test Method: EN 61000-4-5:2014

### 7.20.1 Test Setup Diagram



### 7.20.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 51 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: keep EUT monitoring and data running continual .

### 7.20.3 Test Results:

| Port        | Line        | Level (kV) | Polarity | Result / Observations |
|-------------|-------------|------------|----------|-----------------------|
| Signal port | Line-Ground | 0.5        | +        | A                     |
| Signal port | Line-Ground | 0.5        | -        | A                     |
| Signal port | Line-Ground | 1          | +        | A                     |
| Signal port | Line-Ground | 1          | -        | A                     |

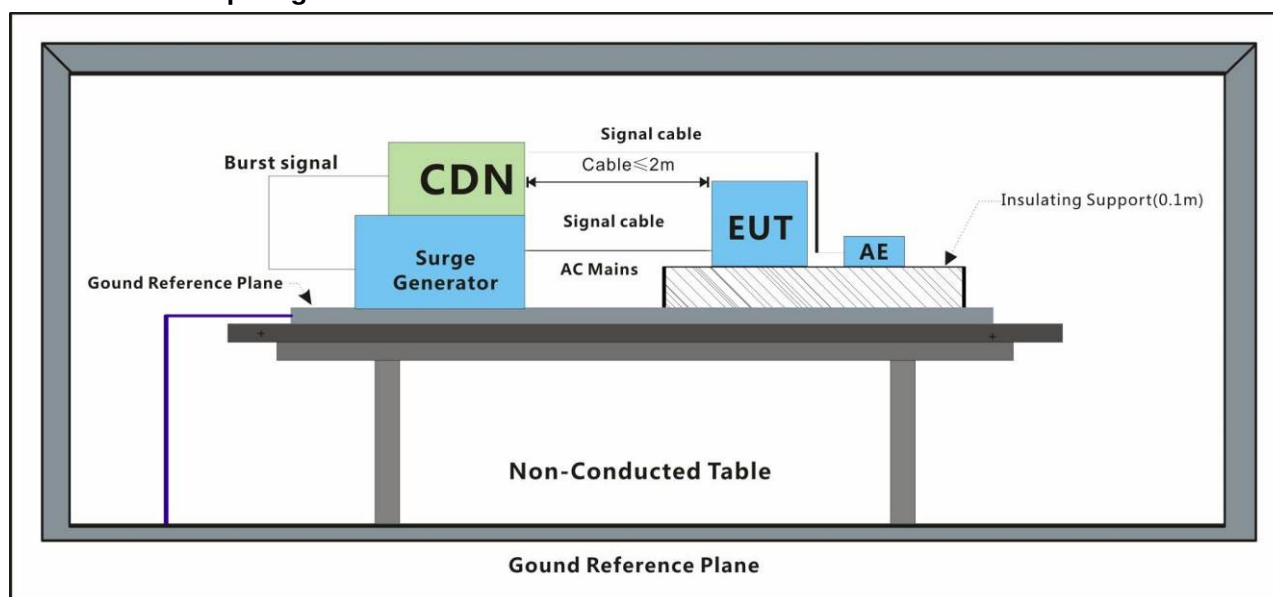
#### Results:

A: No degradation in the performance of the EUT was observed.

## 7.21 Surge at Signal Port

Test Requirement: EN 55035:2017  
 Test Method: EN 61000-4-5:2014  
 Performance Criterion: B  
 Interval: 60s between each surge

### 7.21.1 Test Setup Diagram



### 7.21.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 49 % RH Atmospheric Pressure: 1002 mbar

Test mode: a: keep EUT monitoring and data running continual .

### 7.21.3 Test Results:

| Port        | Line        | Level (kV) | Polarity | Result / Observations |
|-------------|-------------|------------|----------|-----------------------|
| Signal port | Line-Ground | 1          | +        | A                     |
| Signal port | Line-Ground | 1          | -        | A                     |

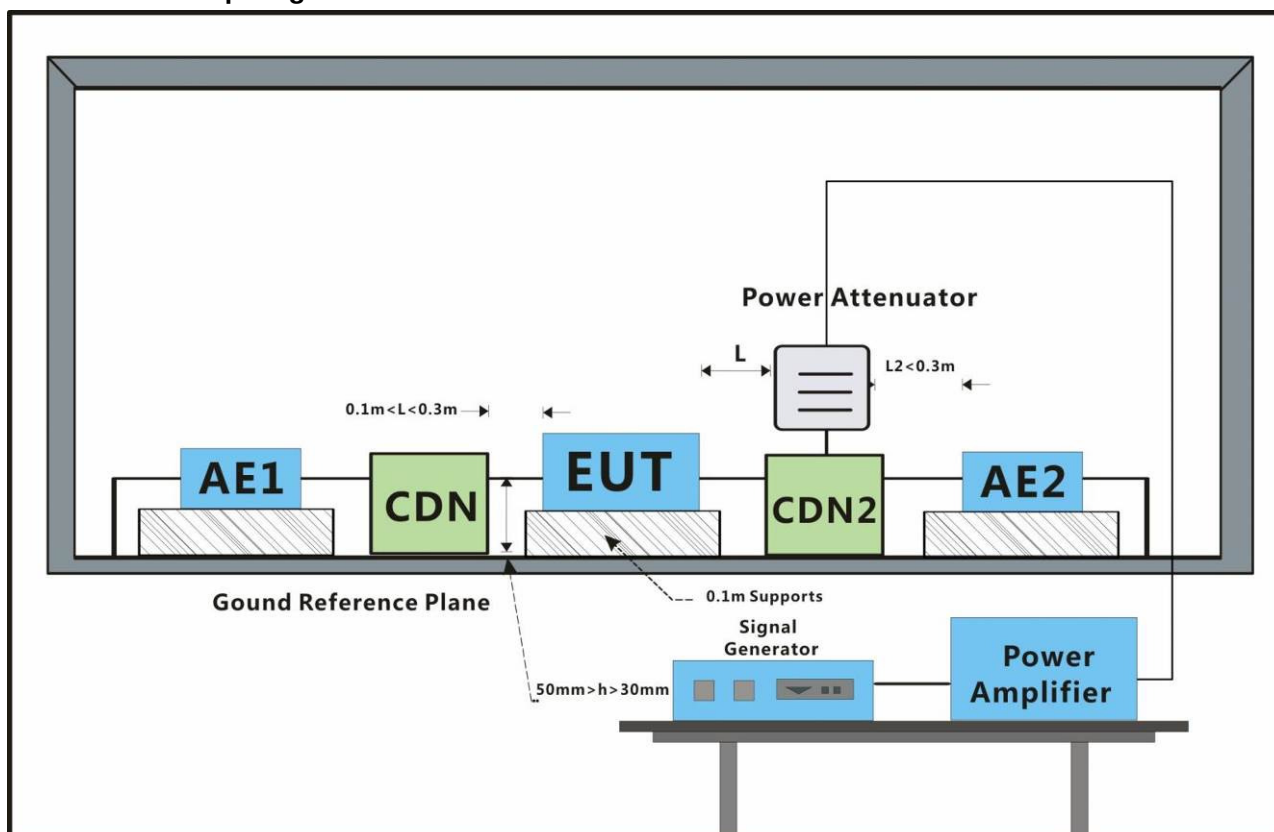
#### Results:

A: No degradation in the performance of the EUT was observed.

## 7.22 Conducted Immunity at Power Port (150kHz-80MHz)

Test Requirement: EN 55024:2010 +A1:2015  
 Test Method: EN 61000-4-6:2014  
 Performance Criterion: A  
 Frequency Range: 0.15MHz to 80MHz  
 Modulation: 80%, 1kHz Amplitude Modulation  
 Step Size: 1%

### 7.22.1 Test Setup Diagram



### 7.22.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: keep EUT monitoring and data running continual.

### 7.22.3 Test Results:

| Cable port    | Level (Vrms) | CDN/Clamp | Dwell time | Result / Observations |
|---------------|--------------|-----------|------------|-----------------------|
| AC power port | 3            | CDN       | 3s         | A                     |

#### Results:

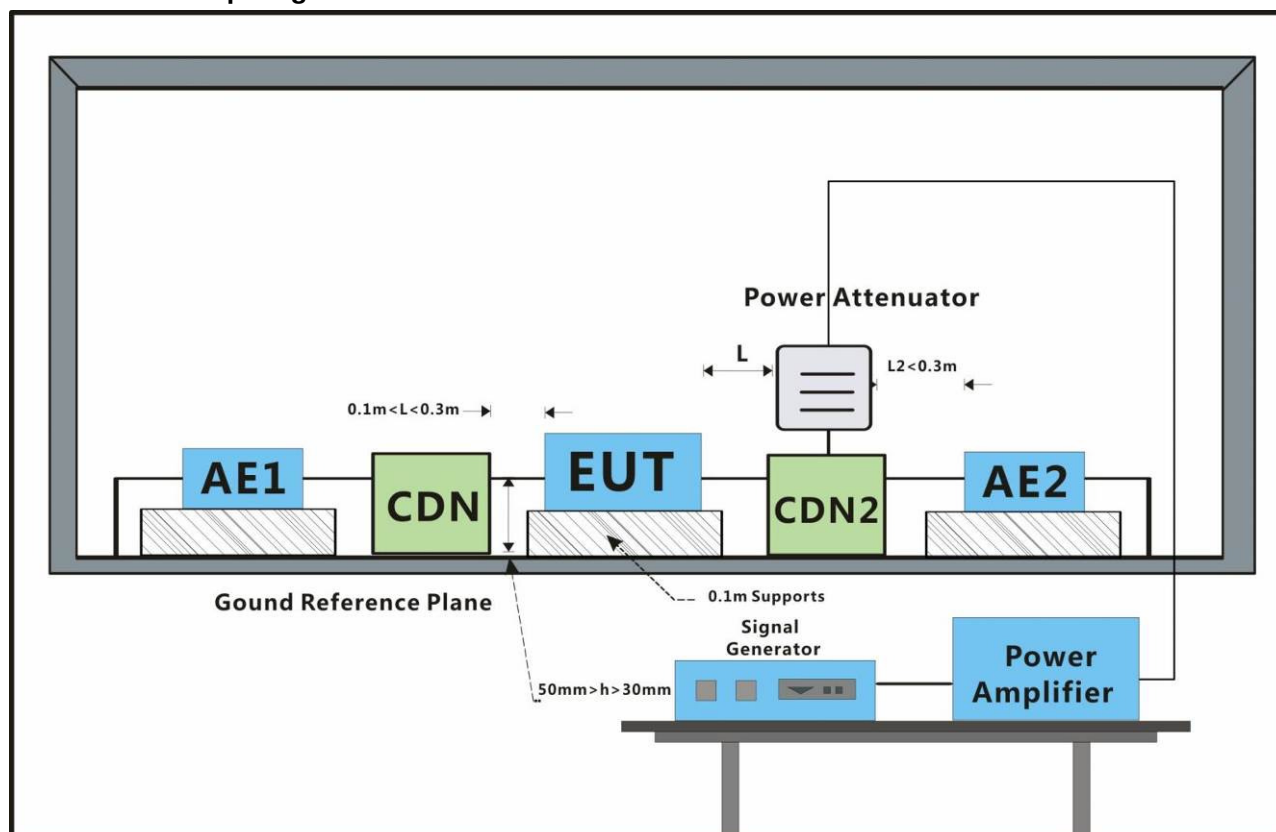
A: No degradation in the performance of the EUT was observed.



## 7.23 Conducted Immunity at Power Port (150kHz-80MHz)

Test Requirement: EN 55035:2017  
 Test Method: EN 61000-4-6:2014  
 Performance Criterion: A  
 Frequency Range: 0.15MHz to 80MHz  
 Modulation: 80%, 1kHz Amplitude Modulation  
 Step Size: 1%

### 7.23.1 Test Setup Diagram



### 7.23.2 E.U.T. Operation

Operating Environment:

Temperature: 21 °C Humidity: 48 % RH Atmospheric Pressure: 1002 mbar

Test mode: a: keep EUT monitoring and data running continual.

### 7.23.3 Test Results:

| Cable port    | Level (Vrms)               | CDN/Clamp | Dwell time | Result / Observations |
|---------------|----------------------------|-----------|------------|-----------------------|
| AC power port | 3(0.15MHz-10MHz)           | CDN       | 3s         | A                     |
| AC power port | 3 to 1(10MHz-30MHz, Lines) | CDN       | 3s         | A                     |
| AC power port | 1(30MHz-80MHz)             | CDN       | 3s         | A                     |

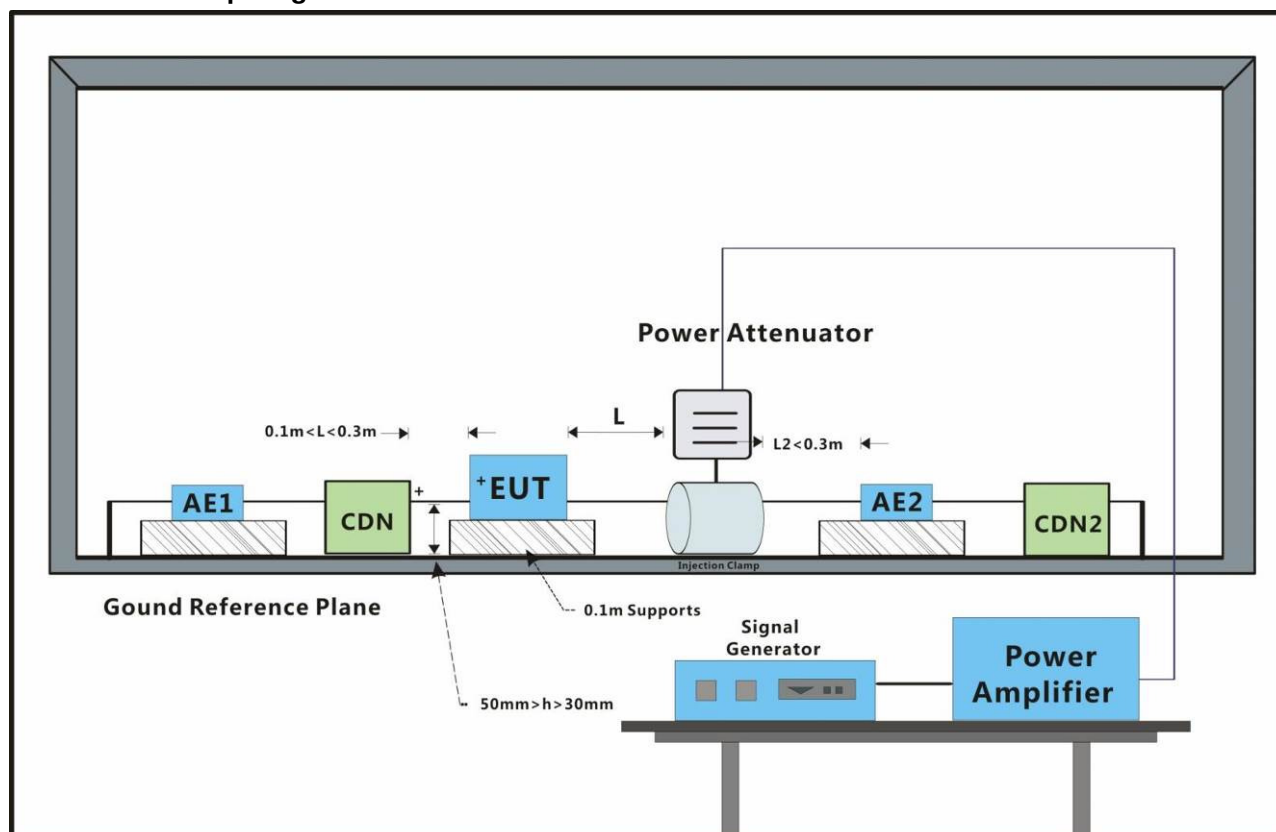
### Results:

A: No degradation in the performance of the EUT was observed.

## 7.24 Conducted Immunity at Signal Port (150kHz-80MHz)

Test Requirement: EN 55024:2010 +A1:2015  
 Test Method: EN 61000-4-6:2014  
 Performance Criterion: A  
 Frequency Range: 0.15MHz to 80MHz  
 Modulation: 80%, 1kHz Amplitude Modulation  
 Step Size: 1%

### 7.24.1 Test Setup Diagram



### 7.24.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: keep EUT monitoring and data running continual .

### 7.24.3 Test Results:

| Port        | Level (Vrms) | CDN/Clamp | Dwell time | Result / Observations |
|-------------|--------------|-----------|------------|-----------------------|
| Signal port | 3            | Coupling  | 3s         | A                     |

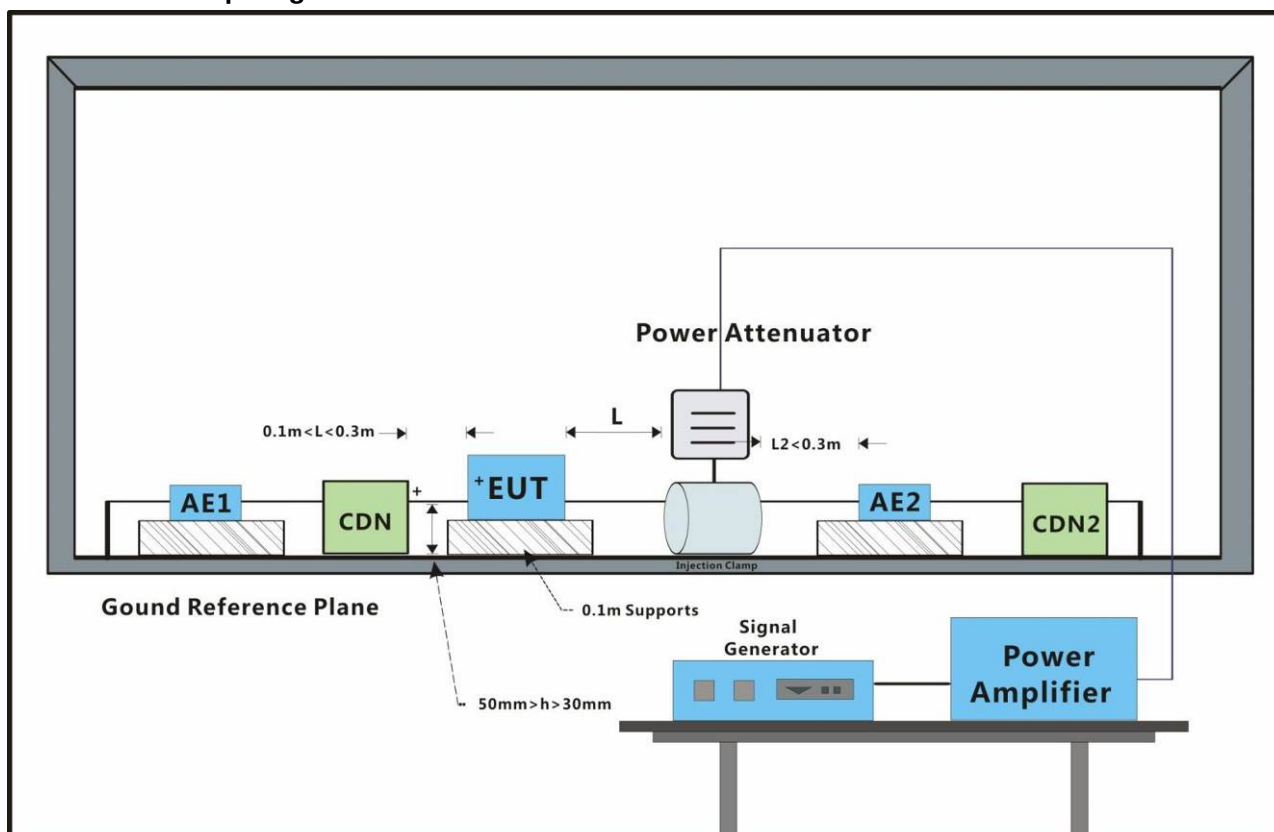
#### Results:

A: No degradation in the performance of the EUT was observed.

## 7.25 Conducted Immunity at Signal Port (150kHz-80MHz)

Test Requirement: EN 55035:2017  
 Test Method: EN 61000-4-6:2014  
 Performance Criterion: A  
 Frequency Range: 0.15MHz to 80MHz  
 Modulation: 80%, 1kHz Amplitude Modulation  
 Step Size: 1%

### 7.25.1 Test Setup Diagram



### 7.25.2 E.U.T. Operation

Operating Environment:

Temperature: 21 °C Humidity: 51 % RH Atmospheric Pressure: 1002 mbar

Test mode: a: keep EUT monitoring and data running continual .

### 7.25.3 Test Results:

| Port        | Level (Vrms)               | CDN/Clamp | Dwell time | Result / Observations |
|-------------|----------------------------|-----------|------------|-----------------------|
| Signal port | 3(0.15MHz-10MHz)           | CDN       | 3s         | A                     |
| Signal port | 3 to 1(10MHz-30MHz, Lines) | CDN       | 3s         | A                     |
| Signal port | 1(30MHz-80MHz)             | CDN       | 3s         | A                     |

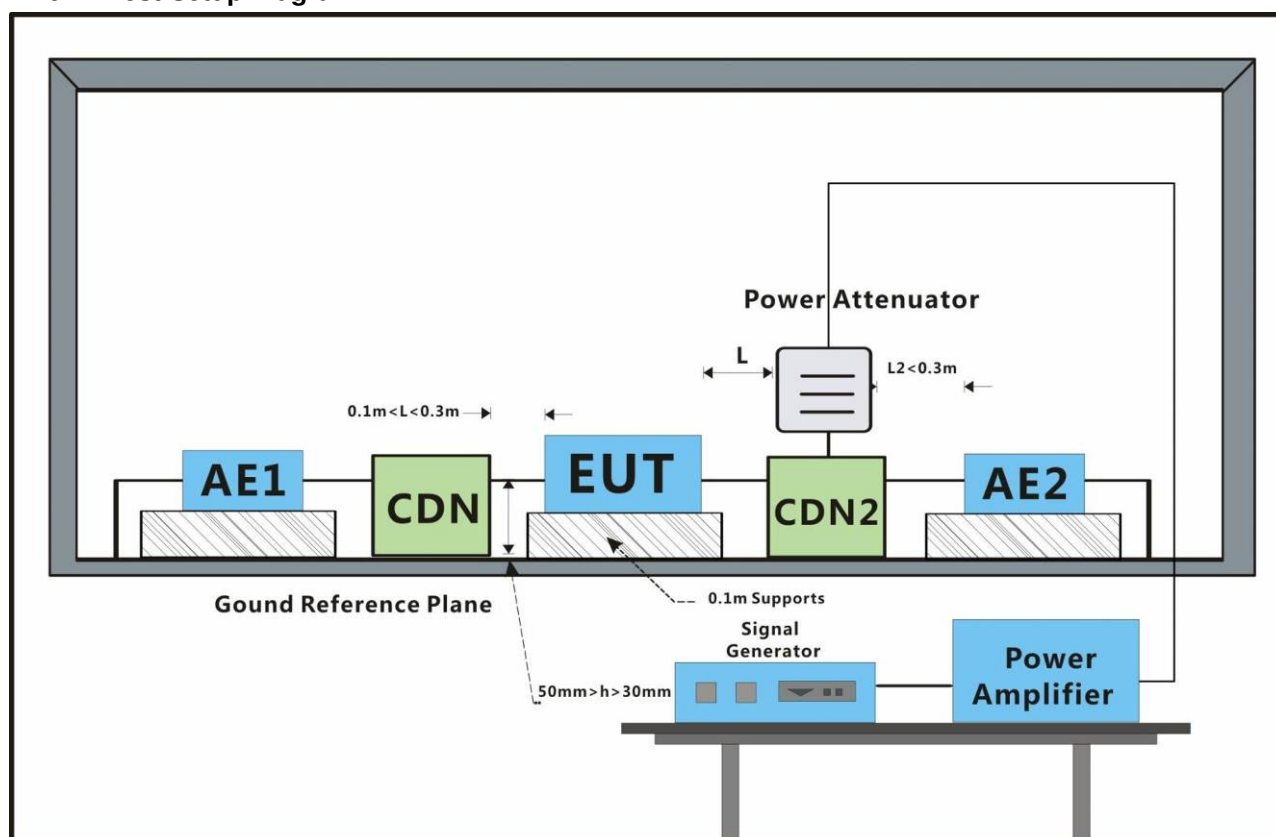
### Results:

A: No degradation in the performance of the EUT was observed.

## 7.26 Conducted Immunity at Power Port (150kHz-100MHz)

Test Requirement: EN 50130-4:2011 +A1:2014  
 Test Method: EN 61000-4-6:2014  
 Modulation: 80%, 1 kHz Amplitude Modulation & 0.5s ON 0.5s OFF Pulse Modulation  
 Criteria for compliance: There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no

### 7.26.1 Test Setup Diagram



### 7.26.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: keep EUT monitoring and data running continual.

### 7.26.3 Test Results:

| Cable port    | Level (Vrms) | CDN/Clamp | Dwell time | Result / Observations |
|---------------|--------------|-----------|------------|-----------------------|
| AC power port | 10           | CDN       | 3s         | A                     |

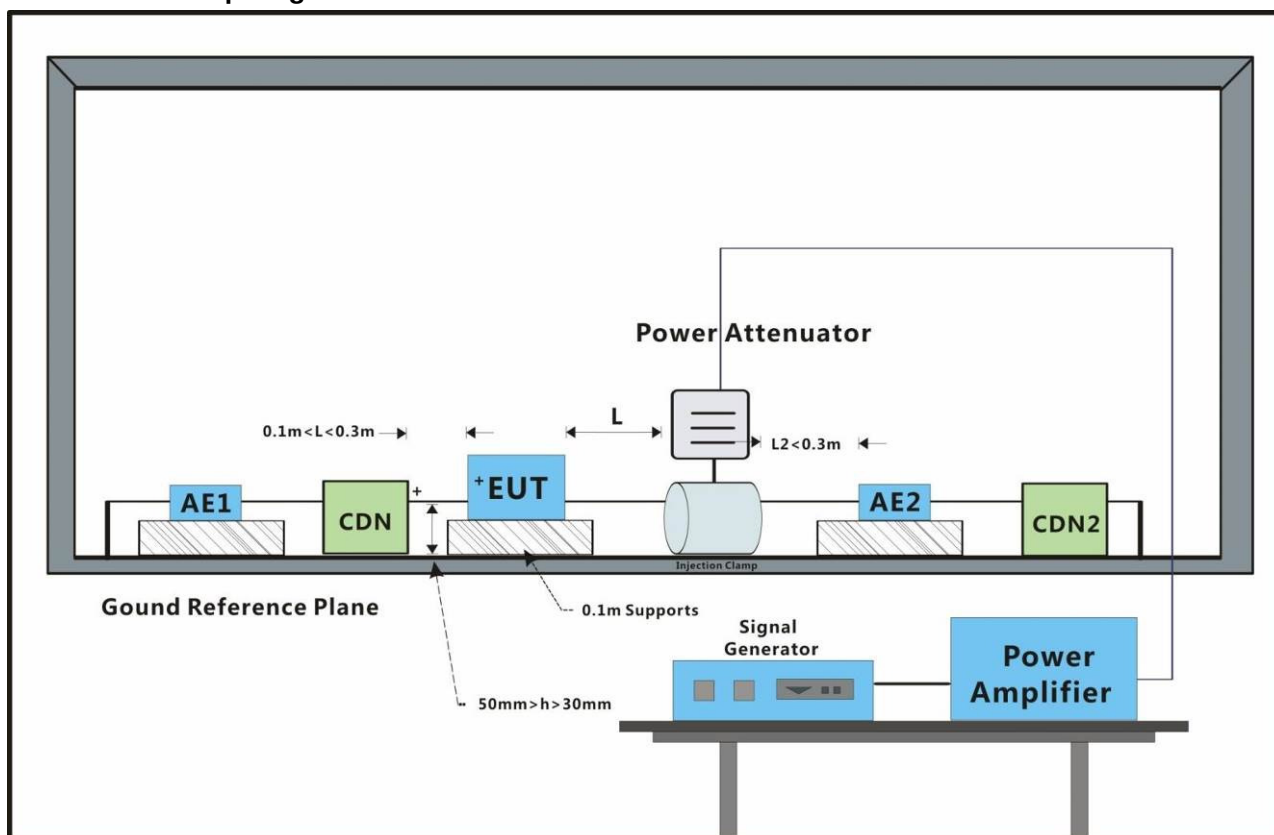
#### Results:

A: No degradation in the performance of the EUT was observed.

## 7.27 Conducted Immunity at Signal Port (150kHz-100MHz)

Test Requirement: EN 50130-4:2011 +A1:2014  
 Test Method: EN 61000-4-6:2014  
 Modulation: 80%, 1 kHz Amplitude Modulation & 0.5s ON 0.5s OFF Pulse Modulation  
 Criteria for compliance: There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no

### 7.27.1 Test Setup Diagram



### 7.27.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: keep EUT monitoring and data running continual.

### 7.27.3 Test Results:

| Port        | Level (Vrms) | CDN/Clamp | Dwell time | Result / Observations |
|-------------|--------------|-----------|------------|-----------------------|
| Signal port | 10           | Coupling  | 3s         | A                     |

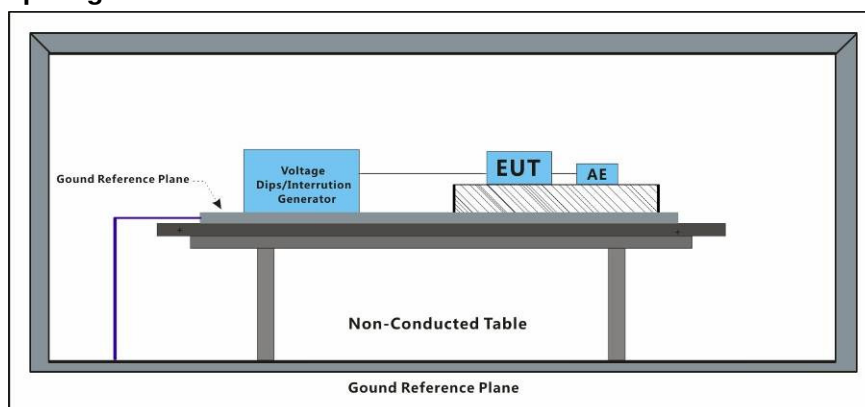
#### Results:

A: No degradation in the performance of the EUT was observed.

## 7.28 Voltage Dips and Interruptions

Test Requirement: EN 55024:2010 +A1:2015  
 Test Method: EN 61000-4-11:2004  
 Performance Criterion: 0% of UT (Supply Voltage) for 0.5 Periods:B; 0% of UT for 250 Periods:C; 70 % of UT for 25 Periods:C  
 No. of Dips / Interruptions: 3 per Level  
 Time between dropout 10s

### 7.28.1 Test Setup Diagram



### 7.28.2 E.U.T. Operation

Operating Environment:  
 Temperature: 22 °C Humidity: 51 % RH Atmospheric Pressure: 1020 mbar  
 Test mode: a: keep EUT monitoring and data running continual .

### 7.28.3 Test Results:

| Level % UT | Phase (deg) | Duration   | No. of Dips / Interruptions | Result / Observations |
|------------|-------------|------------|-----------------------------|-----------------------|
| 0          | 0°          | 0.5 Cycles | 3                           | A                     |
| 0          | 180°        | 0.5 Cycles | 3                           | A                     |
| 0          | 0°          | 250 Cycles | 3                           | C                     |
| 0          | 180°        | 250 Cycles | 3                           | C                     |
| 70         | 0°          | 25 Cycles  | 3                           | A                     |
| 70         | 180°        | 25 Cycles  | 3                           | A                     |

#### Results:

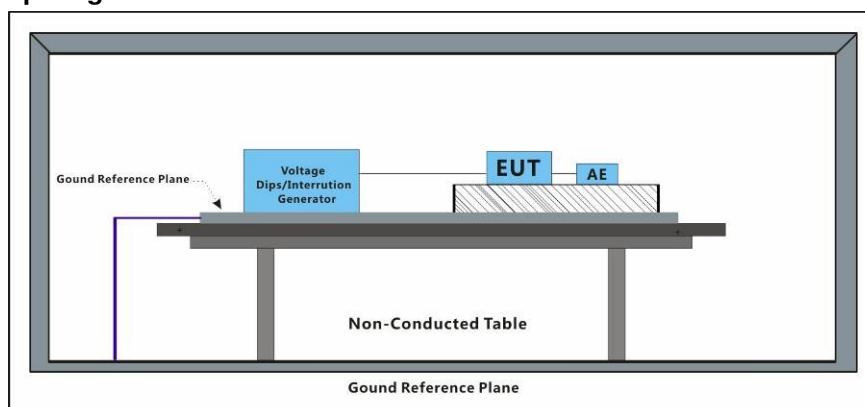
A: No degradation in the performance of the EUT was observed.  
 C: During test, EUT stop work, After test ,EUT restart by operator



## 7.29 Voltage Dips and Interruptions

Test Requirement: EN 50130-4:2011 +A1:2014  
 Test Method: EN 61000-4-11:2004  
 Performance Criterion: 0% of UT (Supply Voltage) for 250 Periods; 40% of UT for 10 Periods; 70% of UT for 25 Periods; 80% of UT for 250 Periods;  
 No. of Dips / Interruptions: 3 per Level  
 Time between dropout 10s

### 7.29.1 Test Setup Diagram



### 7.29.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 51 % RH Atmospheric Pressure: 1020 mbar

Test mode: a: keep EUT monitoring and data running continual .

### 7.29.3 Test Results:

| Level % UT | Phase (deg) | Duration   | No. of Dips / Interruptions | Result / Observations |
|------------|-------------|------------|-----------------------------|-----------------------|
| 80         | 0°          | 250 Cycles | 3                           | A                     |
| 80         | 180°        | 250 Cycles | 3                           | A                     |
| 70         | 0°          | 25 Cycles  | 3                           | A                     |
| 70         | 180°        | 25 Cycles  | 3                           | A                     |
| 40         | 0°          | 10 Cycles  | 3                           | A                     |
| 40         | 180°        | 10 Cycles  | 3                           | A                     |
| 0          | 0°          | 250 Cycles | 3                           | C                     |
| 0          | 180°        | 250 Cycles | 3                           | C                     |

#### Results:

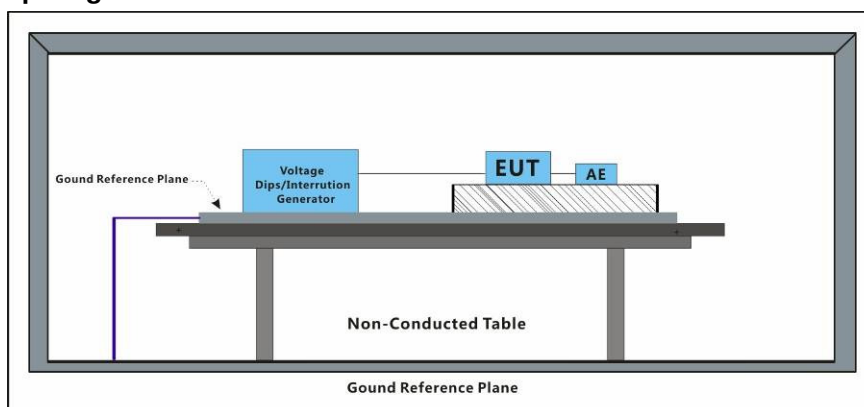
A: No degradation in the performance of the EUT was observed.

C: During test, EUT stop work, After test ,EUT restart by operator

### 7.30 Voltage Dips and Interruptions

Test Requirement: EN 55035:2017  
 Test Method: EN 61000-4-11:2004  
 Performance Criterion: <5% residual voltage for 0.5 periods: B  
 70% residual voltage for 25 periods: C  
 <5% residual voltage for 250 periods: C  
 No. of Dips / Interruptions: 3 per Level  
 Time between dropout 10s

#### 7.30.1 Test Setup Diagram



#### 7.30.2 E.U.T. Operation

Operating Environment:  
 Temperature: 21 °C Humidity: 49 % RH Atmospheric Pressure: 1002 mbar  
 Test mode: a: keep EUT monitoring and data running continual .

#### 7.30.3 Test Results:

| Level % UT | Phase (deg) | Duration   | No. of Dips / Interruptions | Result / Observations |
|------------|-------------|------------|-----------------------------|-----------------------|
| 0          | 0°          | 0.5 Cycles | 3                           | A                     |
| 0          | 0°          | 250 Cycles | 3                           | A                     |
| 70         | 0°          | 25 Cycles  | 3                           | A                     |

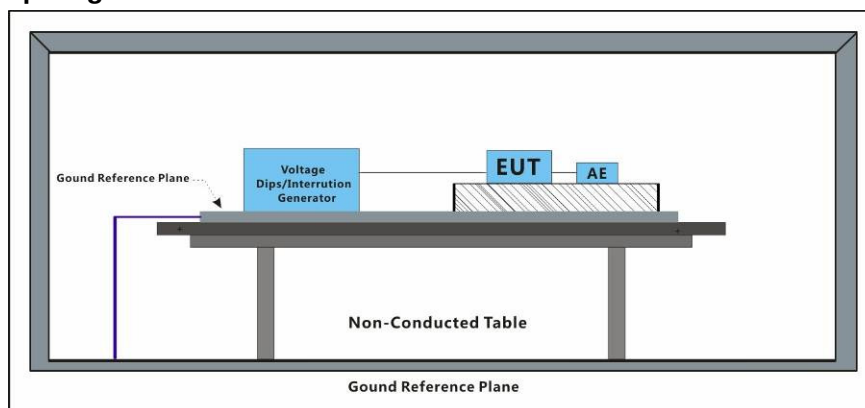
#### Results:

A: No degradation in the performance of the EUT was observed.

### 7.31 Mains Supply Voltage Variations-Conditioning

|                    |   |
|--------------------|---|
| Test Requirement:  | EN 50130-4:2011 +A1:2014  |
| Test Method:       | EN 50130-4:2011+A1:2014   |
| Voltage max.:      | AC 253V ( $U_{max}$ : $U_{nom} + 10\%$ )  |
| Voltage min.:      | AC 195.5V ( $U_{min}$ : $U_{nom} - 15\%$ )  |
| $U_{nom}$ Voltage: | AC 230V   |
| Criteria:          | There shall be no damage, malfunction or change of status due to the different supply voltage conditions. The EUT shall meet the acceptance criteria for the functional test (see Clause 6 of EN 50130-4), during the conditioning. |

#### 7.31.1 Test Setup Diagram



#### 7.31.2 E.U.T. Operation

|                        |   |                       |           |
|------------------------|---|-----------------------|-----------|
| Operating Environment: |   |                       |           |
| Temperature:           | 22 °C   | Humidity:             | 51 % RH   |
|                        |   | Atmospheric Pressure: | 1020 mbar |
| Test mode:             | a: keep EUT monitoring and data running continual . |                       |           |

#### 7.31.3 Test Results:

##### Test phenomenon description for the EUT:

1. The EUT working normal, before the conditioning.
2. Monitor the EUT during the conditioning period and detected no any changes in states, during the conditioning.
3. No degradation in the performance of the EUT was observed, after the conditioning.

## 8 Photographs

### 8.1 Conducted Emissions at Mains Terminals (150kHz-30MHz) Test Setup



### 8.2 Asymmetric Mode Conducted Emissions (150kHz-30MHz) Test Setup



### 8.3 Radiated Emissions (30MHz-1GHz) Test Setup



### 8.4 Radiated Emissions (above 1GHz) Test Setup





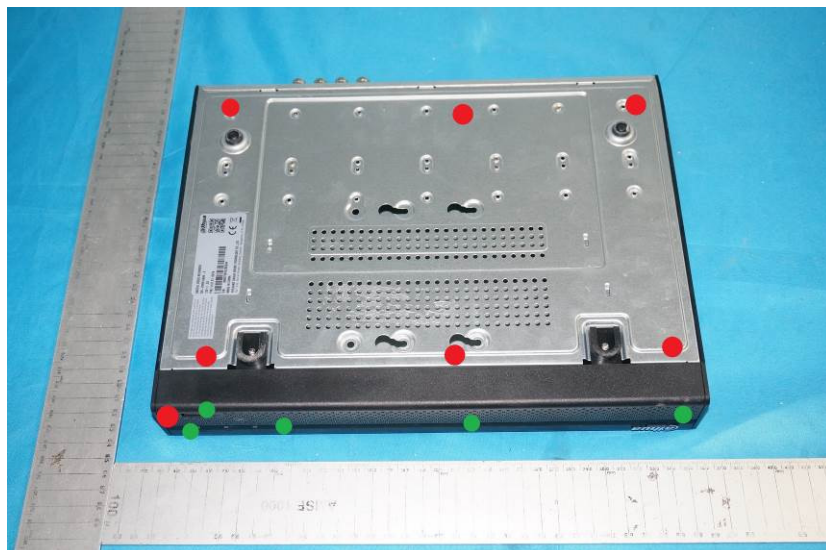
## 8.5 Voltage Fluctuations and Flicker Test Setup



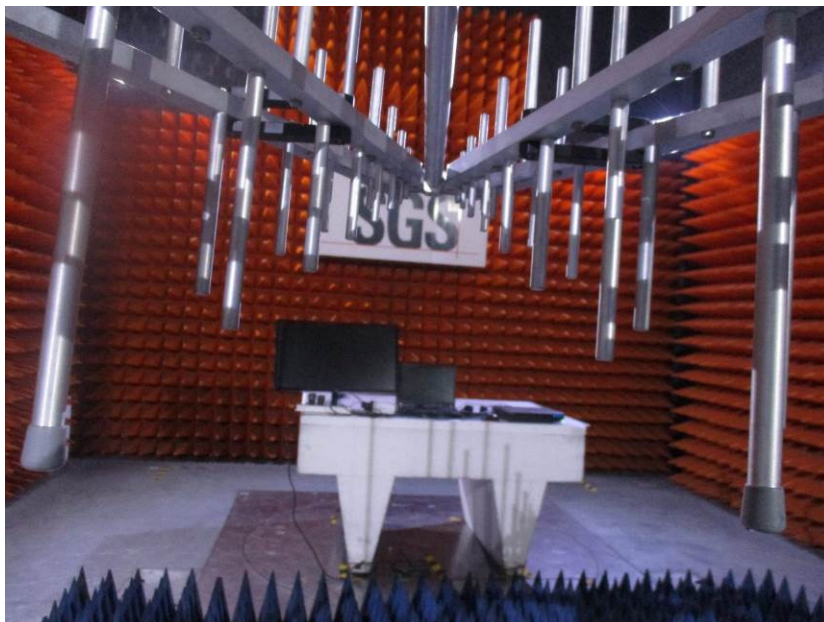
## 8.6 Electrostatic Discharge Test Setup



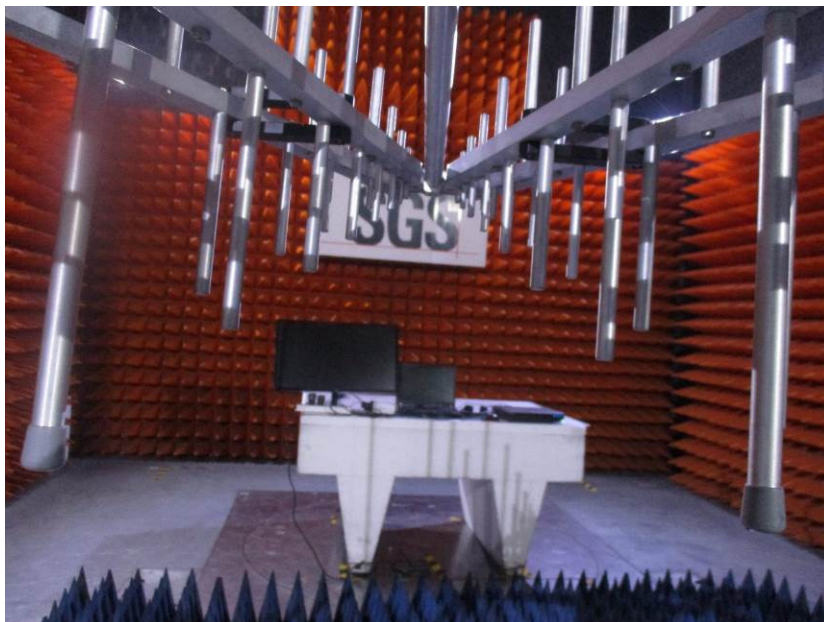




## 8.7 Radiated Immunity (80MHz-1GHz,1800MHz,2600MHz,3500MHz,5000MHz) Test Setup



## 8.8 Radiated Immunity (80MHz-1GHz) Test Setup



## 8.9 Radiated Immunity(80MHz-2.7GHz) Test Setup



## 8.10 Electrical Fast Transients/Burst at Power Port Test Setup





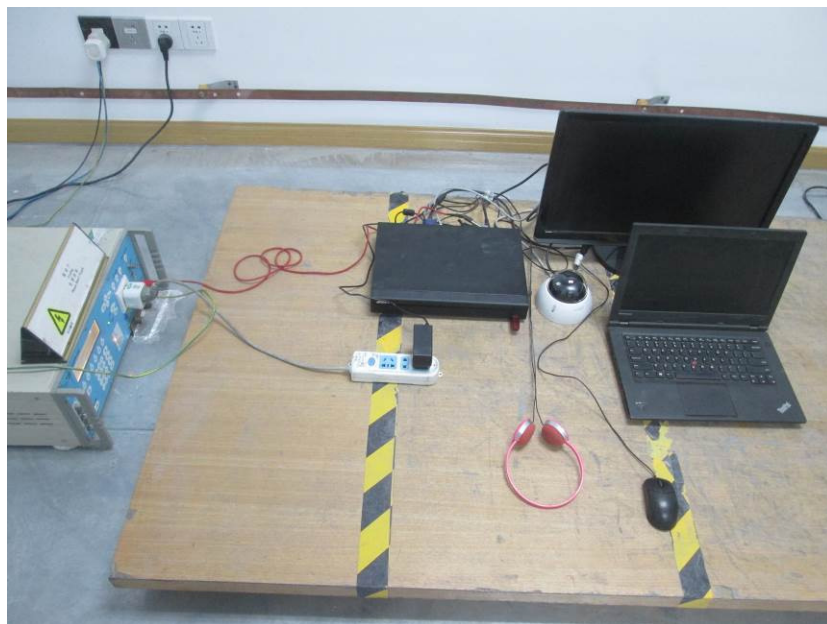
### 8.11 Electrical Fast Transients/Burst at Signal Port Test Setup



### 8.12 Surge at Power Port Test Setup



### 8.13 Surge at Signal Port Test Setup



#### 8.14 Conducted Immunity at Power Port (150kHz-80MHz) Test Setup



#### 8.15 Conducted Immunity at Signal Port (150kHz-80MHz) Test Setup





### 8.16 Conducted Immunity at Power Port (150kHz-100MHz) Test Setup



### 8.17 Conducted Immunity at Signal Port (150kHz-100MHz) Test Setup





### 8.18 Voltage Dips and Interruptions Test Setup

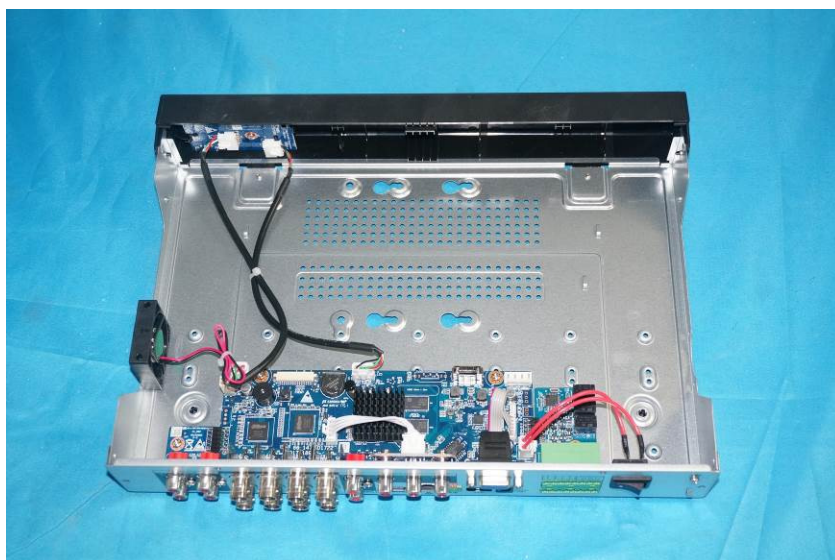


### 8.19 Mains Supply Voltage Variations-Conditioning Test Setup

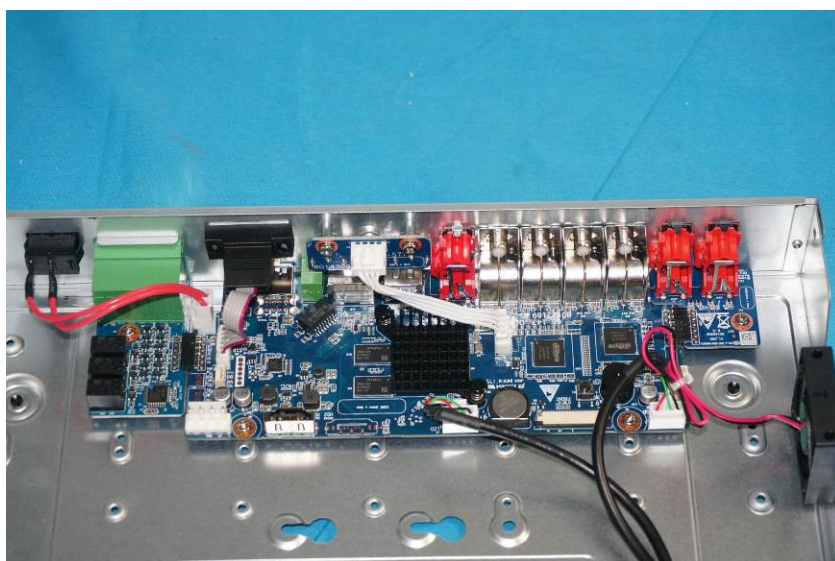
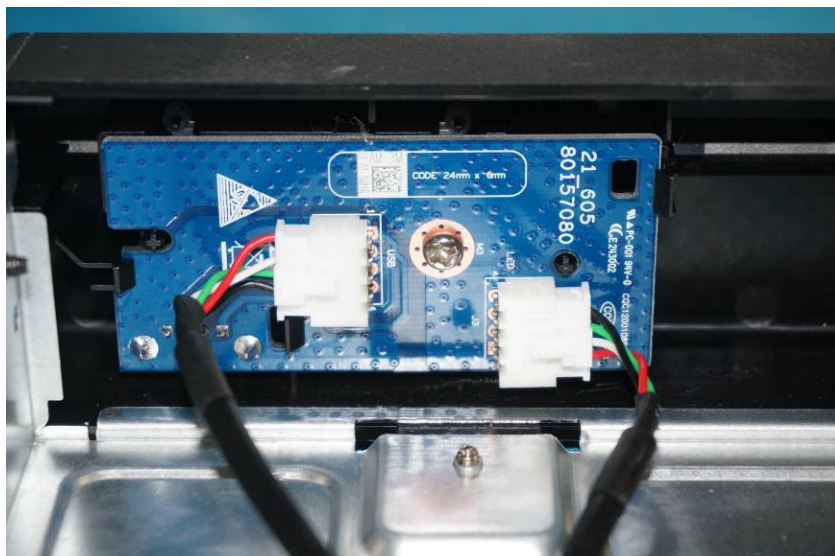


## 8.20 EUT Constructional Details (EUT Photos)











- End of the Report -