



## TEST REPORT

**Application No.:** SHEM1901010462AT  
**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  
**Equipment Under Test (EUT):**  
**EUT Name:** NETWORK Video RECORDER  
**Model No.:** DHI-NVR4432-I, DHI-NVR4408-I, DHI-NVR4416-I, NVR4408-I, NVR4416-I, NVR4432-I, DHI-NVR44xy-ab, NVR44xy-ab  
(XY= 04,08,16,32,64; ab=A~Z or 1~9 or blank; )  
□ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.  
**Standard(s) :** EN 55032:2015 (Class A)  
EN 61000-3-2:2014  
EN 61000-3-3:2013  
EN 55024:2010 +A1:2015  
EN 55035:2017  
EN 50130-4:2011 +A1:2014  
**Date of Receipt:** 2019-01-17  
**Date of Test:** 2019-01-18 to 2019-01-21  
**Date of Issue:** 2019-03-14

<b>Test Result:</b>	<b>Pass*</b>
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\* 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.

Parlan Zhan

Parlan Zhan  
E&E Section Manager



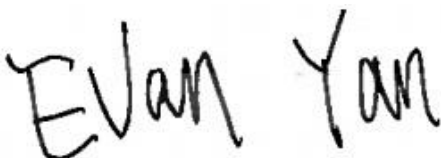

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant 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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Revision Record			
Version	Description	Date	Remark
00	Original	2019-03-14	/

Authorized for issue by:				
				
		<hr/> Evan Yan / Project Engineer		
				
		<hr/> Bruce Tang / Reviewer		

## 2 Test Summary

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

Immunity Part				
Item	Standard	Method	Requirement	Result
Electrostatic Discharge	EN 55024:2010 +A1:2015	EN 61000-4-2:2009	4kV Contact Discharge 8kV Air Discharge	Pass
Electrostatic Discharge	EN 55035:2017	EN 61000-4-2:2009	4kV Contact Discharge 8kV Air Discharge	Pass
Electrostatic Discharge	EN 50130-4:2011 +A1:2014	EN 61000-4-2:2009	6kV Contact Discharge 2,4,8kV 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-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
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
Electrical Fast Transients/Burst at Power Port	EN 50130-4:2011 +A1:2014	EN 61000-4-4:2012	2kV 5/50ns Tr/Td 100kHz Repetition Frequency	Pass
Electrical Fast Transients/Burst at Power Port	EN 55024:2010 +A1:2015	EN 61000-4-4:2012	1kV 5/50ns Tr/Td 5kHz Repetition Frequency	Pass

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

<b>Immunity Part</b>				
<b>Item</b>	<b>Standard</b>	<b>Method</b>	<b>Requirement</b>	<b>Result</b>
Conducted Immunity at Power Port (150kHz-80MHz)	EN 55035:2017	EN 61000-4-6:2014	3 Vrms: 0.15MHz - 10MHz 3 to 1 (Lines) Vrms: 10MHz - 30MHz 1 Vrms: 30MHz - 80MHz 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-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 3 to 1 (Lines) Vrms: 10MHz - 30MHz 1 Vrms: 30MHz - 80MHz 80%,1kHz 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 50130-4:2011 +A1:2014	EN 61000-4-11:2004 +A1:2017	80 % UT for 250per 70 % UT for 25per 40 % UT for 10per 0 % UT for 250per UT is Supply Voltage	Pass
Voltage Dips and Interruptions	EN 55024:2010 +A1:2015	EN 61000-4-11:2004 +A1:2017	0 % UT for 0.5per 0 % UT for 250per 70 % UT for 25per UT is Supply Voltage	Pass
Voltage Dips and Interruptions	EN 55035:2017	EN 61000-4-11:2004 +A1:2017	<5% residual voltage for 0.5 periods: B 70% residual voltage for 25 periods: C <5% residual voltage for 250 periods: C	Pass

<b>Immunity Part</b>				
<b>Item</b>	<b>Standard</b>	<b>Method</b>	<b>Requirement</b>	<b>Result</b>
Mains Supply Voltage Variations-Conditioning	EN 50130-4:2011 +A1:2014	EN 50130-4:2011+A1:2014	Unom+10% 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

**Note: 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 DHI-NVR4432-I was tested since their differences are model number, trade name and appearance.



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## 4 General Information

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

Power supply: AC100-240V, 1.9A, 50/60Hz

### 4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
AC Adapter	HOIOTO	ADS-25FSG-12	/
Hard disk	HGST	HTS541010A9E680	/
Headset	HYUNDAI	HY-R362	/
Laptop	LENOVO	R400	/
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 at mains port using AMN	$\pm 3.2\text{dB}$ (9kHz to 150kHz)
		$\pm 3.0\text{dB}$ (150kHz to 30MHz)
2	Conducted Emission at mains port using VP	$\pm 1.9\text{ dB}$ (9kHz to 30MHz)
3	Conducted Emission at telecommunication port using AAN	$\pm 2.4\text{ dB}$ (150kHz to 30MHz)
4	Radiated Power	$\pm 3.5\text{dB}$
5	Radiated emission	$\pm 4.4\text{dB}$ (30MHz-1GHz)
		$\pm 4.6\text{dB}$ (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.

• **Innovation, Science and Economic Development Canada**

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#### 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	2018-12-20	2019-12-19
Line impedance stabilization network	SCHWARZBECK	NSLK8127	SHEM061-1	2018-12-20	2019-12-19
Line impedance stabilization network	EMCO	3816/2	SHEM019-1	2018-12-20	2019-12-19
Pulse limiter	Rohde & Schwarz	ESH3-Z2	SHEM029-1	2018-12-20	2019-12-19
Shielding Room	ZHONGYU	8*4*3M	SHEM079-2	2017-12-20	2020-12-19
CE test Cable	/	/	CE01	2018-12-26	2019-12-25

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	2018-12-20	2019-12-19
Line impedance stabilization network	SCHWARZBECK	NSLK8127	SHEM061-1	2018-12-20	2019-12-19
8-wire ISN cat 5	SCHWARZBECK	CAT5 8158	SHEM137-1	2018-12-20	2019-12-19
8-wire ISN cat 3	SCHWARZBECK	CAT3 8158	SHEM137-2	2018-12-20	2019-12-19
8-wire ISNcat 6	SCHWARZBECK	NTFM8158	SHEM137-3	2018-12-20	2019-12-19
2-Draht ISN	Schwarzbeck - Mess-Elektronik	NTFM 8131	SHEM139-1	2018-12-20	2019-12-19
CE test Cable	/	/	CE01	2018-12-26	2019-12-25

Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI test receiver	Rohde & Schwarz	ESU40	SHEM051-1	2018-12-20	2019-12-19
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	2020-07-21
Low Amplifier	CLAVIIO	BDLNA-0001-412010	SHEM164-1	2018-08-13	2019-08-12

Radiated Emissions (above 1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
EMI test receiver	Rohde & Schwarz	ESU40	SHEM051-1	2018-12-20	2019-12-19
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	2018-12-20	2019-12-19
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2017-07-22	2020-07-21
High Amplifier	CLAVIIO	BDLNA-0118-352810	SHEM165-1	2018-08-13	2019-08-12



Harmonic & Voltage Fluctuations and Flicker					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Harmonic&Flicker analyzer	AMETEK	PACS-1	SHEM024-2	2018-08-13	2019-08-12
AC Power Source 5KVA	AMETEK	500iX	SHEM025-2	2018-08-13	2019-08-12

Electrostatic Discharge					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Electrostatic Discharge Simulator	TESEQ	NSG 437	SHEM041-2	2018-08-13	2019-08-12

Radiated Immunity (80MHz-1GHz,1800MHz,2600MHz,3500MHz,5000MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Signal generator	Rohde & Schwarz	SMJ100A	SHEM141-1	2018-08-13	2019-08-12
Power Meter	Rohde & Schwarz	NRP	SHEM057-1	2018-12-20	2019-12-19
Power meter sensor	Rohde & Schwarz	NRP-Z91	SHEM057-2	2018-12-20	2019-12-19
Antenna	SCHWARZBECK	STLP9128D	SHEM130-1	N/A	N/A
Amplifier	MILMEGA	AS0840-55-55	SHEM133-1	2018-12-20	2019-12-19
Power meter sensor	Rohde & Schwarz	NRP-Z22	SHEM136-1	2018-12-20	2019-12-19
ElectroMagnetic Field Probe	ETS-Lindgren	HI-6105	SHEM134-1	2018-12-11	2019-12-10

Radiated Immunity(80MHz-2.7GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Signal generator	Rohde & Schwarz	SMJ100A	SHEM141-1	2018-08-13	2019-08-12
Power Meter	Rohde & Schwarz	NRP	SHEM057-1	2018-12-20	2019-12-19
Power meter sensor	Rohde & Schwarz	NRP-Z91	SHEM057-2	2018-12-20	2019-12-19
Antenna	SCHWARZBECK	STLP9128D	SHEM130-1	N/A	N/A
Antenna	SCHWARZBECK	STLP9149	SHEM131-1	N/A	N/A
Amplifier	MILMEGA	80RF1000-250	SHEM132-1	2018-12-20	2019-12-19
Amplifier	MILMEGA	AS0840-55-55	SHEM133-1	2018-12-20	2019-12-19
Power meter sensor	Rohde & Schwarz	NRP-Z22	SHEM136-1	2018-12-20	2019-12-19
ElectroMagnetic Field Probe	ETS-Lindgren	HI-6105	SHEM134-1	2018-12-11	2019-12-10
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2017-07-22	2020-07-21

Radiated Immunity (80MHz-1GHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Signal generator	Rohde & Schwarz	SMJ100A	SHEM141-1	2018-08-13	2019-08-12
Power Meter	Rohde & Schwarz	NRP	SHEM057-1	2018-12-20	2019-12-19
Power meter sensor	Rohde & Schwarz	NRP-Z91	SHEM057-2	2018-12-20	2019-12-19
Antenna	SCHWARZBECK	STLP9128D	SHEM130-1	N/A	N/A
Amplifier	MILMEGA	AS0840-55-55	SHEM133-1	2018-12-20	2019-12-19
Power meter sensor	Rohde & Schwarz	NRP-Z22	SHEM136-1	2018-12-20	2019-12-19
ElectroMagnetic Field Probe	ETS-Lindgren	HI-6105	SHEM134-1	2018-12-11	2019-12-10
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2017-07-22	2020-07-21

**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	2018-12-20	2019-12-19

**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	2018-12-20	2019-12-19
Capacitive coupling clamp	EM test	HFK	SHEM026-2	2018-12-20	2019-12-19
Data coupling network 4 line	EM test	CNV 504	SHEM026-3	2018-12-20	2019-12-19

**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	2018-12-20	2019-12-19

**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	2018-12-20	2019-12-19
Data coupling network 4 line	EM test	CNV 504	SHEM026-3	2018-12-20	2019-12-19

**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	2018-08-13	2019-08-12
PAMP Conducted RF test system	HAEFFLY	PAMP250	SHEM023-1	2018-12-20	2019-12-19
6dB Attenuator	HUAXIANG	DTS50-6dB-1G-A	SHEM123-2	2018-12-20	2019-12-19
Coupling clamp	LIITHI	EM 101	SHEM027-1	2018-12-20	2019-12-19
CDN impedance and K-factor	LUTHI	L-801 M1	SHEM023-5	2018-12-20	2019-12-19
CDN impedance and K-factor	LUTHI	L-801 M2/M3	SHEM023-6	2018-12-20	2019-12-19
Shielding Room	ZHONGYU	5*5*3M	SHEM079-6	2016-12-29	2019-12-28
Coupling and Decoupling Network	Teseq	CDN M016	SHEM168-1	2018-08-13	2019-08-12

**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	2018-08-13	2019-08-12
PAMP Conducted RF test system	HAEFFLY	PAMP250	SHEM023-1	2018-12-20	2019-12-19
6dB Attenuator	HUAXIANG	DTS50-6dB-1G-A	SHEM123-2	2018-12-20	2019-12-19
CDN impedance and K-factor	LUTHI	L-801 M1	SHEM023-5	2018-12-20	2019-12-19
CDN impedance and K-factor	LUTHI	L-801 M2/M3	SHEM023-6	2018-12-20	2019-12-19



Shielding Room	ZHONGYU	5*5*3M	SHEM079-6	2016-12-29	2019-12-28
Coupling and Decoupling Network	Teseq	CDN M016	SHEM168-1	2018-08-13	2019-08-12

**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	2018-08-13	2019-08-12
PAMP Conducted RF test system	HAEFFLY	PAMP250	SHEM023-1	2018-12-20	2019-12-19
6dB Attenuator	HUAXIANG	DTS50-6dB-1G-A	SHEM123-2	2018-12-20	2019-12-19
Coupling clamp	LIITHI	EM 101	SHEM027-1	2018-12-20	2019-12-19
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	2018-08-13	2019-08-12
PAMP Conducted RF test system	HAEFFLY	PAMP250	SHEM023-1	2018-12-20	2019-12-19
6dB Attenuator	HUAXIANG	DTS50-6dB-1G-A	SHEM123-2	2018-12-20	2019-12-19
Coupling clamp	LIITHI	EM 101	SHEM027-1	2018-12-20	2019-12-19
CDN impedance and K-factor	LUTHI	L-801 M1	SHEM023-5	2018-12-20	2019-12-19
CDN impedance and K-factor	LUTHI	L-801 M2/M3	SHEM023-6	2018-12-20	2019-12-19
Coupling and Decoupling Network	Teseq	CDN M016	SHEM168-1	2018-08-13	2019-08-12

**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	2018-12-20	2019-12-19

**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	2018-12-20	2019-12-19

**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	2021-01-24
Temperature&humidity recorder	ShangHai weather meter work	ZJ 1-2B	SHEM042-1~6	2018-08-31	2019-08-30
Digital Multimeter	FLUKE	17B	SHEM043-3	2018-09-03	2019-09-02
Autoformer regulator	Guangzhou bao de	TDGC2-5KVA	SHEM150-1	N/A	N/A
Multi-purpose tong tester	FLUKE	316	SHEM001-1	2018-12-20	2019-12-19

## 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	79dB(μV) quasi-peak, 66dB(μV) average
0.5M-30MHz	73dB(μV) quasi-peak, 60dB(μV) average
Detector:	Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

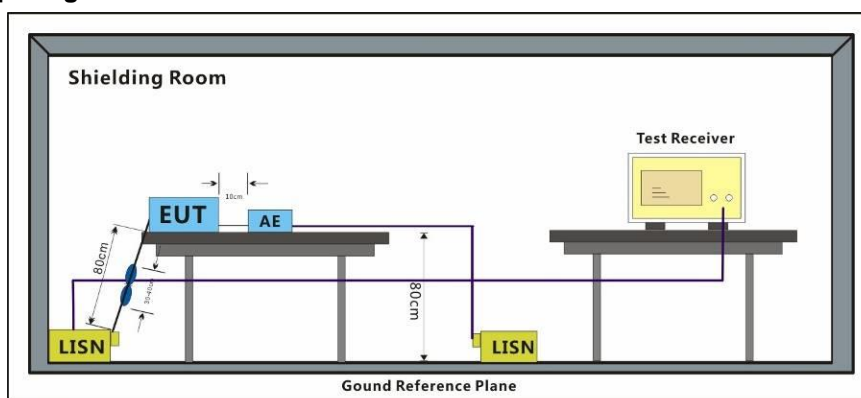
#### 6.1.1 E.U.T. Operation

Operating Environment:

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

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

#### 6.1.2 Test Setup Diagram

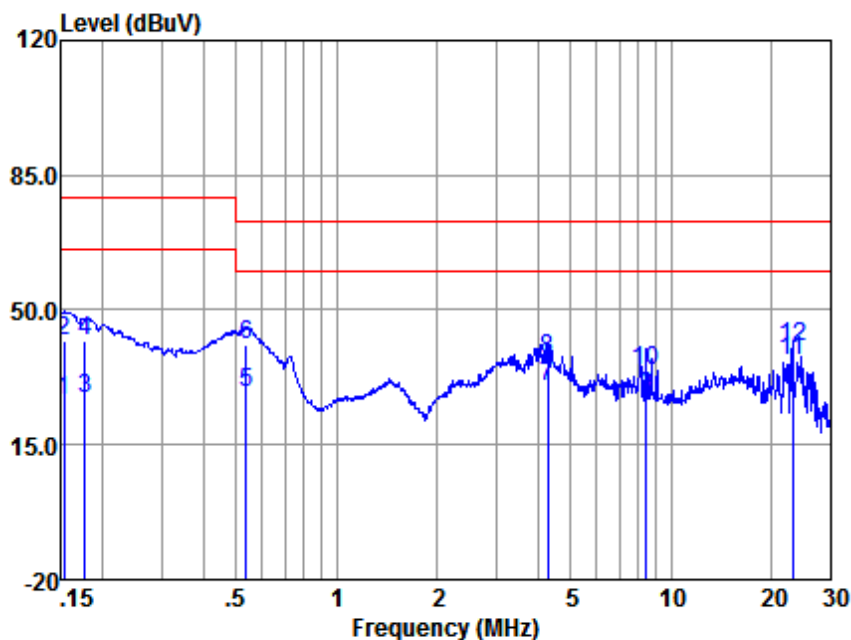


#### 6.1.3 Measurement Data

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

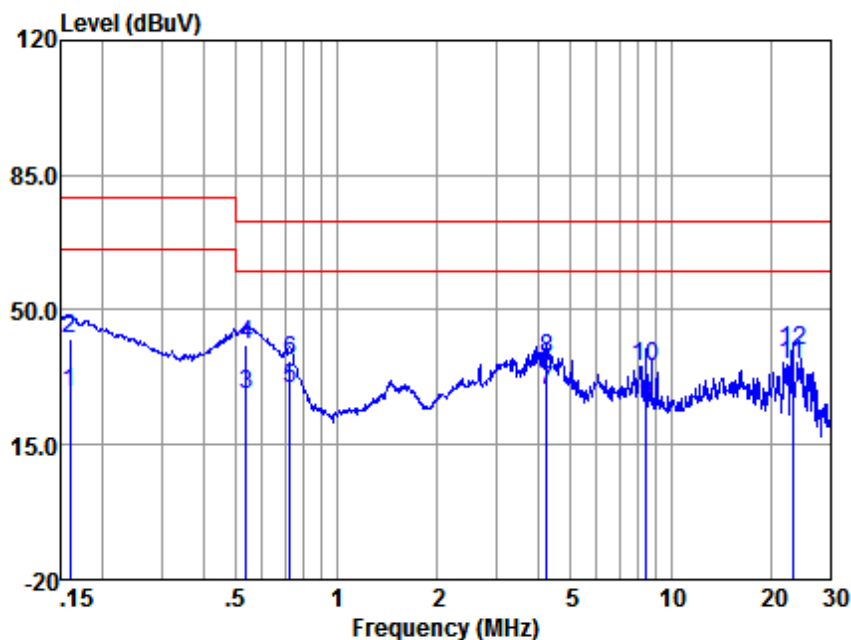


LISN : LINE  
EUT/Project No : 10462AT  
Test mode : a

	Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.15	16.70	0.05	9.82	26.57	66.00	-39.43	Average
2	0.15	32.27	0.05	9.82	42.14	79.00	-36.86	QP
3	0.18	17.18	0.05	9.83	27.06	66.00	-38.94	Average
4	0.18	31.89	0.05	9.83	41.77	79.00	-37.23	QP
5	0.54	18.89	0.05	9.76	28.70	60.00	-31.30	Average
6	0.54	30.96	0.05	9.76	40.77	73.00	-32.23	QP
7	4.29	19.99	0.07	9.88	29.94	60.00	-30.06	Average
8	4.29	27.60	0.07	9.88	37.55	73.00	-35.45	QP
9	8.45	17.49	0.16	9.89	27.54	60.00	-32.46	Average
10	8.45	24.38	0.16	9.89	34.43	73.00	-38.57	QP
11	23.13	26.73	0.41	9.94	37.08	60.00	-22.92	Average
12	23.13	30.02	0.41	9.94	40.37	73.00	-32.63	QP

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

Mode:a; Line:Neutral Line



LISN : NEUTRAL

EUT/Project No : 10462AT

Test mode : a

	Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.16	18.44	0.06	9.82	28.32	66.00	-37.68	Average
2	0.16	32.85	0.06	9.82	42.73	79.00	-36.27	QP
3	0.54	18.16	0.05	9.76	27.97	60.00	-32.03	Average
4	0.54	31.39	0.05	9.76	41.20	73.00	-31.80	QP
5	0.72	19.58	0.05	9.86	29.49	60.00	-30.51	Average
6	0.72	26.96	0.05	9.86	36.87	73.00	-36.13	QP
7	4.24	18.87	0.08	9.90	28.85	60.00	-31.15	Average
8	4.24	27.31	0.08	9.90	37.29	73.00	-35.71	QP
9	8.45	15.27	0.17	9.89	25.33	60.00	-34.67	Average
10	8.45	24.97	0.17	9.89	35.03	73.00	-37.97	QP
11	23.13	25.50	0.40	9.94	35.84	60.00	-24.16	Average
12	23.13	29.08	0.40	9.94	39.42	73.00	-33.58	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)	97-87(dBμV) quasi-peak; 84-74(dBμV) average
0.5M-30MHz(Voltage)	87(dBμV) quasi-peak; 74(dBμV) average
0.15M-0.5MHz(Current)	53-43(dBμA) quasi-peak; 40-30(dBμA) average
0.5M-30MHz(Current)	43(dBμV) quasi-peak; 30(dBμV) 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.

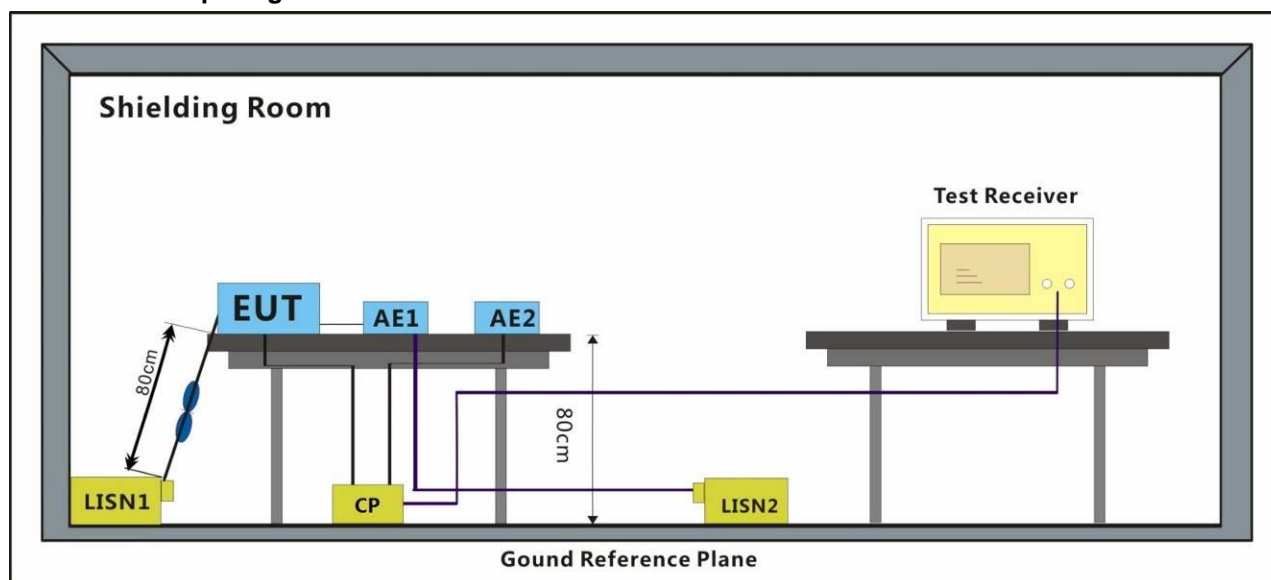
### 6.2.1 E.U.T. Operation

Operating Environment:

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

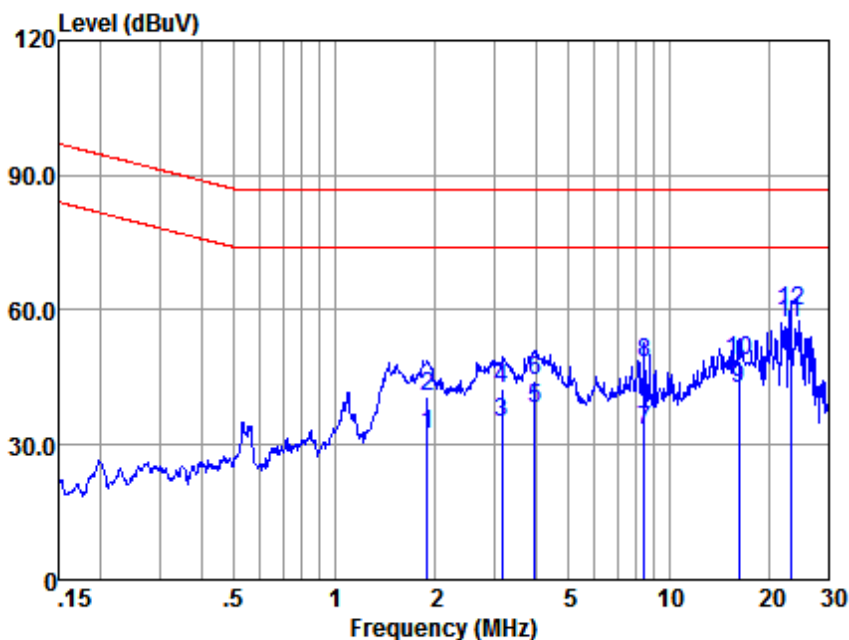
Test mode a: keep EUT monitoring and data running continually.

### 6.2.2 Test Setup Diagram



### 6.2.3 Measurement Data

Mode:a



ISN : ISN CAT5

EUT/Project No : 10462AT

Test Mode : a

	Freq (MHz)	Read level (dBuV)	ISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	1.90	13.33	9.28	9.89	32.50	74.00	-41.50	Average
2	1.90	21.49	9.28	9.89	40.66	87.00	-46.34	QP
3	3.17	15.93	9.23	9.88	35.04	74.00	-38.96	Average
4	3.17	23.24	9.23	9.88	42.35	87.00	-44.65	QP
5	3.99	18.80	9.22	9.89	37.91	74.00	-36.09	Average
6	3.99	25.18	9.22	9.89	44.29	87.00	-42.71	QP
7	8.45	13.92	9.20	9.89	33.01	74.00	-40.99	Average
8	8.45	29.12	9.20	9.89	48.21	87.00	-38.79	QP
9	16.23	23.52	9.25	9.94	42.71	74.00	-31.29	Average
10	16.23	29.66	9.25	9.94	48.85	87.00	-38.15	QP
11	23.13	37.73	9.35	9.94	57.02	74.00	-16.98	Average
12	23.13	40.42	9.35	9.94	59.71	87.00	-27.29	QP

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

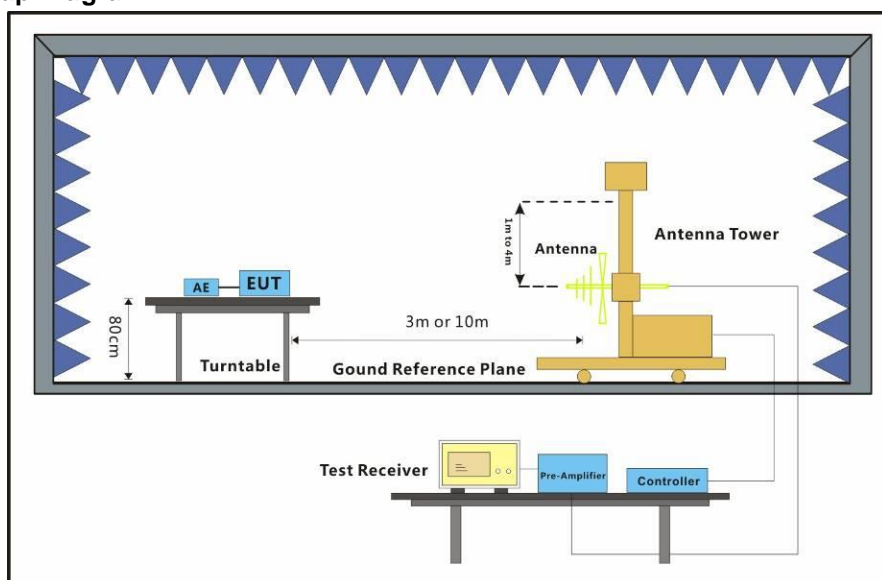
### 6.3 Radiated Emissions (30MHz-1GHz)

Test Requirement: EN 55032:2015  
 Test Method: EN 55032:2015  
 Frequency Range: 30MHz to 1GHz  
 Measurement Distance: 3m  
 Limit:  
 30MHz-230MHz 50 dB( $\mu$ V/m) quasi-peak  
 230MHz-1GHz 57 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 continually.

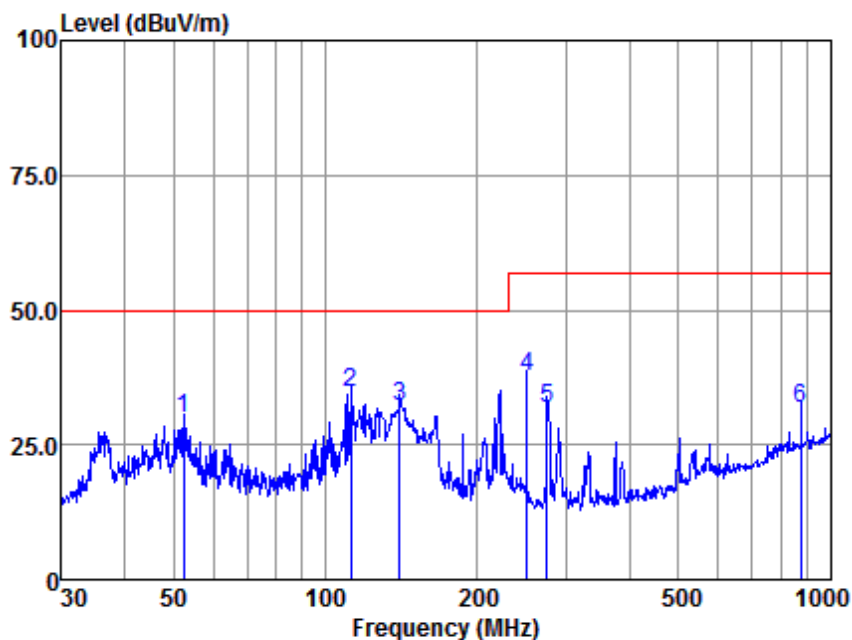
#### 6.3.2 Test Setup Diagram



#### 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

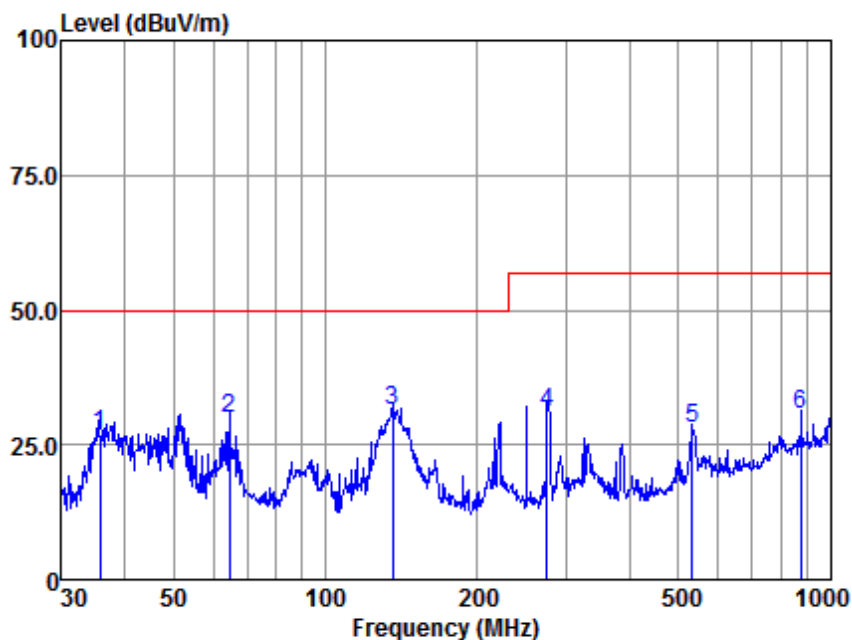
EUT/Project :0462AT

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	52.39	59.83	11.10	1.20	42.33	29.80	50.00	-20.20	QP
2	112.52	65.45	9.71	1.89	42.29	34.76	50.00	-15.24	QP
3	140.34	61.05	11.30	2.13	42.25	32.23	50.00	-17.77	QP
4	250.30	65.45	11.52	2.84	42.10	37.71	57.00	-19.29	QP
5	275.16	58.46	12.38	3.04	42.11	31.77	57.00	-25.23	QP
6	875.25	45.36	22.52	5.62	41.72	31.78	57.00	-25.22	QP

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

Mode:a; Polarization:Vertical



Antenna Polarity :VERTICAL

EUT/Project :0462AT

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	35.75	52.56	15.91	0.97	42.35	27.09	50.00	-22.91	QP
2	64.43	58.85	12.05	1.35	42.30	29.95	50.00	-20.05	QP
3	135.98	59.75	11.92	2.09	42.25	31.51	50.00	-18.49	QP
4	275.16	57.66	12.38	3.04	42.11	30.97	57.00	-26.03	QP
5	533.83	47.38	17.97	4.24	41.68	27.91	57.00	-29.09	QP
6	875.25	44.09	22.52	5.62	41.72	30.51	57.00	-26.49	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	76 dB( $\mu$ V/m) peak, 56 dB( $\mu$ V/m) average
3GHz-6GHz	80 dB( $\mu$ V/m) peak, 60dB( $\mu$ V/m) average
Detector:	Peak for pre-scan (1000kHz resolution bandwidth) 1000M to 6000MHz

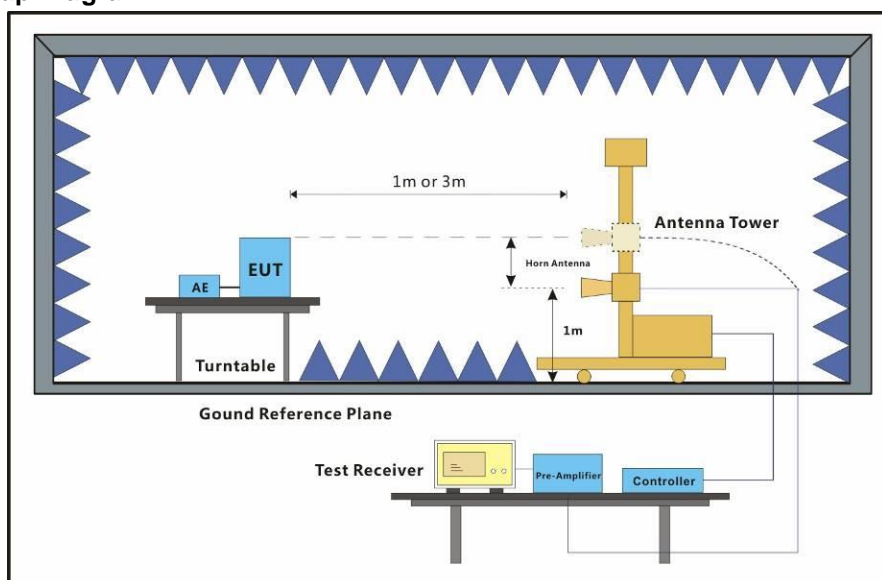
### 6.4.1 E.U.T. Operation

Operating Environment:

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

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

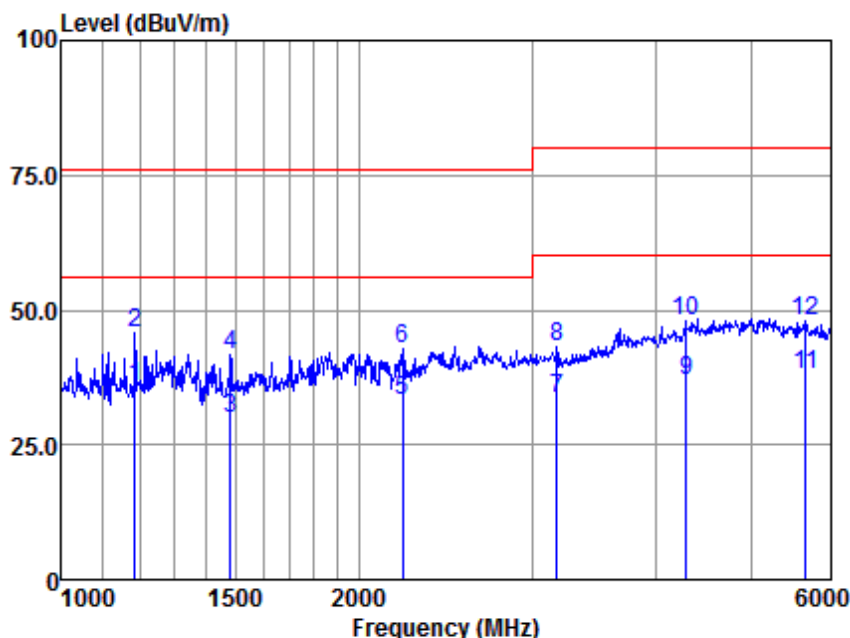
### 6.4.2 Test Setup Diagram



### 6.4.3 Measurement Data

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

Mode:a; Polarization:Horizontal



Antenna Polarity :HORIZONTAL

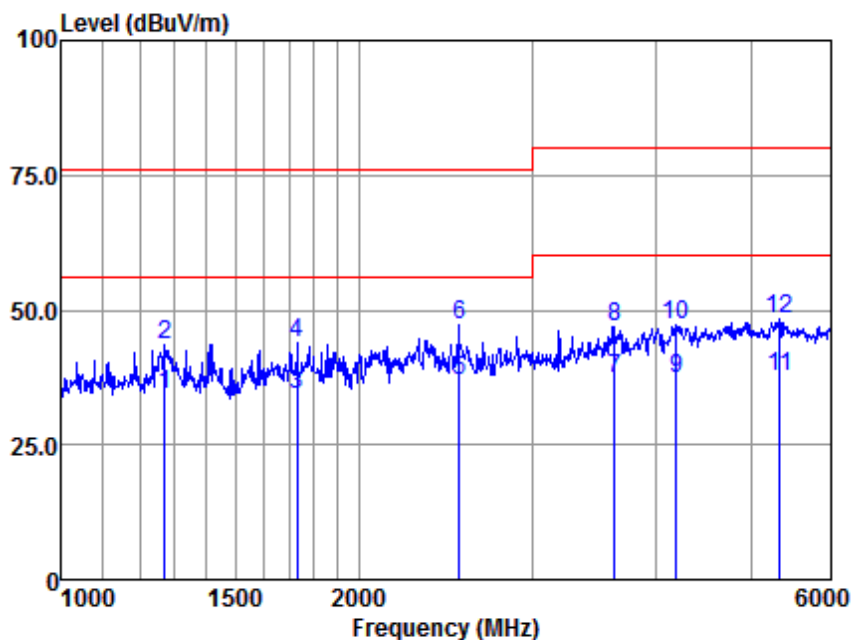
EUT/Project :0462AT

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	1187.69	49.73	24.57	3.37	41.82	35.85	56.00	-20.15	Average
2	1187.69	59.50	24.57	3.37	41.82	45.62	76.00	-30.38	Peak
3	1483.18	43.02	25.17	3.80	41.92	30.07	56.00	-25.93	Average
4	1483.18	54.48	25.17	3.80	41.92	41.53	76.00	-34.47	Peak
5	2215.64	43.89	26.64	4.92	42.20	33.25	56.00	-22.75	Average
6	2215.64	53.31	26.64	4.92	42.20	42.67	76.00	-33.33	Peak
7	3170.51	40.94	28.61	5.92	41.76	33.71	60.00	-26.29	Average
8	3170.51	50.58	28.61	5.92	41.76	43.35	80.00	-36.65	Peak
9	4284.09	41.03	30.22	7.48	41.79	36.94	60.00	-23.06	Average
10	4284.09	51.90	30.22	7.48	41.79	47.81	80.00	-32.19	Peak
11	5665.66	39.31	32.13	8.34	41.95	37.83	60.00	-22.17	Average
12	5665.66	49.27	32.13	8.34	41.95	47.79	80.00	-32.21	Peak

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

Mode:a; Polarization:Vertical



Antenna Polarity :VERTICAL

EUT/Project :0462AT

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	1271.37	47.78	24.75	3.48	41.85	34.16	56.00	-21.84	Average
2	1271.37	57.34	24.75	3.48	41.85	43.72	76.00	-32.28	Peak
3	1733.38	46.67	25.60	4.15	42.08	34.34	56.00	-21.66	Average
4	1733.38	56.31	25.60	4.15	42.08	43.98	76.00	-32.02	Peak
5	2525.25	46.06	27.45	5.37	42.15	36.73	56.00	-19.27	Average
6	2525.25	56.47	27.45	5.37	42.15	47.14	76.00	-28.86	Peak
7	3626.53	43.76	29.05	6.45	41.89	37.37	60.00	-22.63	Average
8	3626.53	53.44	29.05	6.45	41.89	47.05	80.00	-32.95	Peak
9	4192.96	41.71	30.06	7.39	41.84	37.32	60.00	-22.68	Average
10	4192.96	51.69	30.06	7.39	41.84	47.30	80.00	-32.70	Peak
11	5330.81	39.45	31.80	8.26	41.88	37.63	60.00	-22.37	Average
12	5330.81	50.20	31.80	8.26	41.88	48.38	80.00	-31.62	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

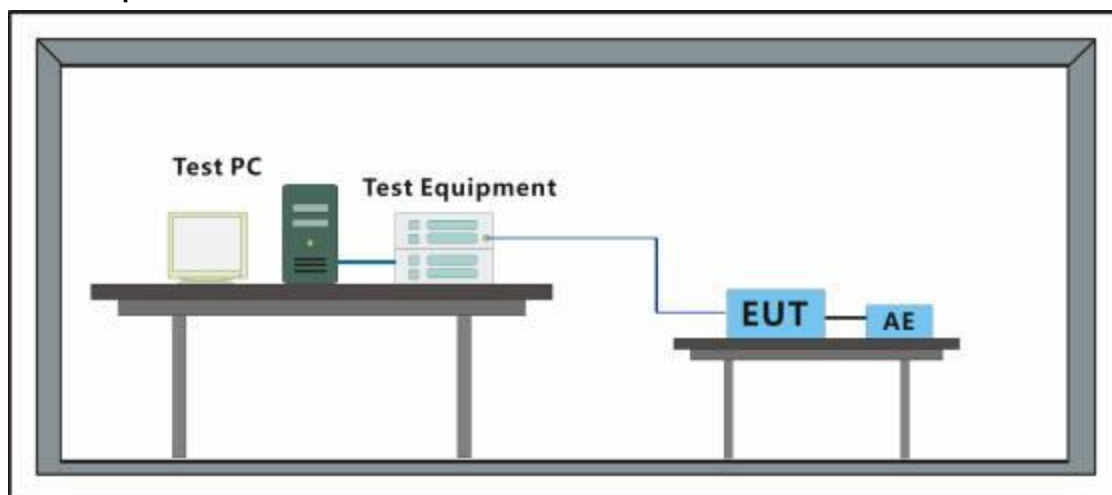
### 6.5.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

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

### 6.5.2 Test Setup



### 6.5.3 Measurement Data



Mode:a

Highest parameter values during test:

V\_RMS (Volts): 230.13

I\_Peak (Amps): 4.140

I\_Fund (Amps): 0.943

Power (Watts): 201.2

Frequency(Hz): 50.00

I\_RMS (Amps): 1.190

Crest Factor: 3.481

Power Factor: 0.897

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	N/A	0.004	1.620	N/A	Pass
3	0.111	2.300	4.8	0.115	3.450	3.3	Pass
4	0.001	0.430	N/A	0.002	0.645	N/A	Pass
5	0.031	1.140	2.7	0.033	1.710	1.9	Pass
6	0.000	0.300	N/A	0.001	0.450	N/A	Pass
7	0.032	0.770	4.2	0.034	1.155	2.9	Pass
8	0.000	0.230	N/A	0.001	0.345	N/A	Pass
9	0.016	0.400	4.0	0.017	0.600	2.9	Pass
10	0.000	0.184	N/A	0.001	0.276	N/A	Pass
11	0.025	0.330	7.5	0.026	0.495	5.2	Pass
12	0.000	0.153	N/A	0.001	0.230	N/A	Pass
13	0.017	0.210	8.1	0.022	0.315	6.9	Pass
14	0.000	0.131	N/A	0.001	0.197	N/A	Pass
15	0.012	0.150	8.0	0.014	0.225	6.2	Pass
16	0.000	0.115	N/A	0.000	0.173	N/A	Pass
17	0.010	0.132	7.7	0.010	0.198	5.3	Pass
18	0.000	0.102	N/A	0.001	0.153	N/A	Pass
19	0.019	0.118	16.5	0.021	0.178	11.6	Pass
20	0.000	0.092	N/A	0.001	0.138	N/A	Pass
21	0.006	0.107	5.4	0.006	0.161	3.8	Pass
22	0.000	0.084	N/A	0.001	0.125	N/A	Pass
23	0.012	0.098	12.0	0.016	0.147	11.0	Pass
24	0.000	0.077	N/A	0.000	0.115	N/A	Pass
25	0.012	0.090	13.6	0.014	0.135	10.5	Pass
26	0.000	0.071	N/A	0.000	0.107	N/A	Pass
27	0.014	0.083	17.2	0.015	0.125	11.8	Pass
28	0.000	0.066	N/A	0.000	0.099	N/A	Pass
29	0.009	0.078	11.1	0.009	0.116	8.1	Pass
30	0.000	0.061	N/A	0.000	0.092	N/A	Pass
31	0.009	0.073	12.0	0.009	0.109	8.4	Pass
32	0.000	0.058	N/A	0.001	0.086	N/A	Pass
33	0.004	0.068	N/A	0.005	0.102	N/A	Pass
34	0.000	0.054	N/A	0.000	0.081	N/A	Pass
35	0.004	0.064	N/A	0.007	0.096	N/A	Pass
36	0.000	0.051	N/A	0.000	0.077	N/A	Pass
37	0.008	0.061	12.9	0.008	0.091	9.0	Pass
38	0.000	0.048	N/A	0.000	0.073	N/A	Pass
39	0.011	0.058	18.3	0.011	0.087	12.4	Pass
40	0.000	0.046	N/A	0.001	0.069	N/A	Pass

N/A: Harmonic currents less than 0.6% of the input current measured under the test conditions, or less than 5mA, whichever is greater, are disregarded



Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.070	0.460	15.24	OK
3	0.398	2.070	19.20	OK
4	0.047	0.460	10.28	OK
5	0.040	0.920	4.35	OK
6	0.015	0.460	3.36	OK
7	0.027	0.690	3.87	OK
8	0.012	0.460	2.61	OK
9	0.028	0.460	6.02	OK
10	0.016	0.460	3.43	OK
11	0.019	0.230	8.26	OK
12	0.015	0.230	6.70	OK
13	0.013	0.230	5.86	OK
14	0.005	0.230	2.25	OK
15	0.010	0.230	4.47	OK
16	0.007	0.230	2.96	OK
17	0.011	0.230	4.57	OK
18	0.008	0.230	3.40	OK
19	0.019	0.230	8.33	OK
20	0.013	0.230	5.79	OK
21	0.007	0.230	3.00	OK
22	0.004	0.230	1.89	OK
23	0.013	0.230	5.67	OK
24	0.005	0.230	2.20	OK
25	0.013	0.230	5.69	OK
26	0.005	0.230	2.09	OK
27	0.019	0.230	8.07	OK
28	0.004	0.230	1.86	OK
29	0.012	0.230	5.32	OK
30	0.004	0.230	1.90	OK
31	0.012	0.230	5.17	OK
32	0.004	0.230	1.65	OK
33	0.007	0.230	3.21	OK
34	0.003	0.230	1.14	OK
35	0.009	0.230	4.00	OK
36	0.003	0.230	1.21	OK
37	0.012	0.230	5.08	OK
38	0.003	0.230	1.18	OK
39	0.015	0.230	6.49	OK
40	0.007	0.230	2.92	OK

## 6.6 Voltage Fluctuations and Flicker

Test Requirement: EN 61000-3-3:2013

Test Method: EN 61000-3-3:2013

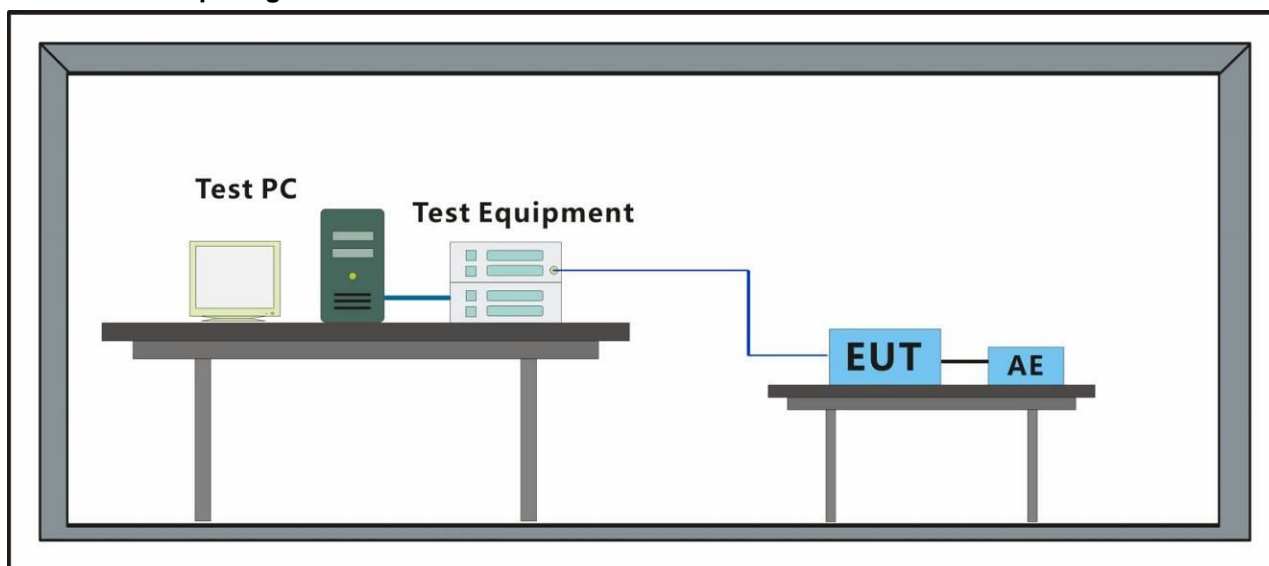
### 6.6.1 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1002 mbar

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

### 6.6.2 Test Setup Diagram



### 6.6.3 Measurement Data

Mode:a

Vrms at the end of test (Volt): 229.77

T-max (mS): 0

Highest dc (%): 0.12

Highest dmax (%): 0.22

Highest Pst (10 min. period): 0.223

Test limit (mS): 500.0 Pass

Test limit (%): 3.30 Pass

Test limit (%): 4.00 Pass

Test limit: 1.000 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 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.

**7.3 Performance Criteria Description in EN 50130-4:2011 +A1:2014**

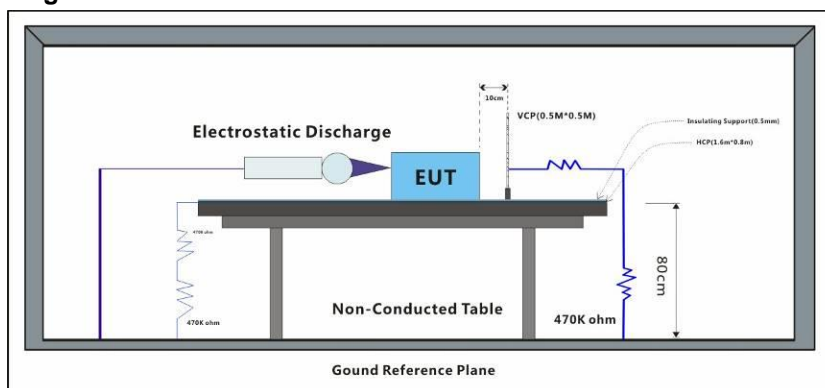
There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the application of the discharges is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as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

## 7.4 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: 48 % RH Atmospheric Pressure: 1010 mbar  
 Test mode: a: keep EUT monitoring and data running continually.

### 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

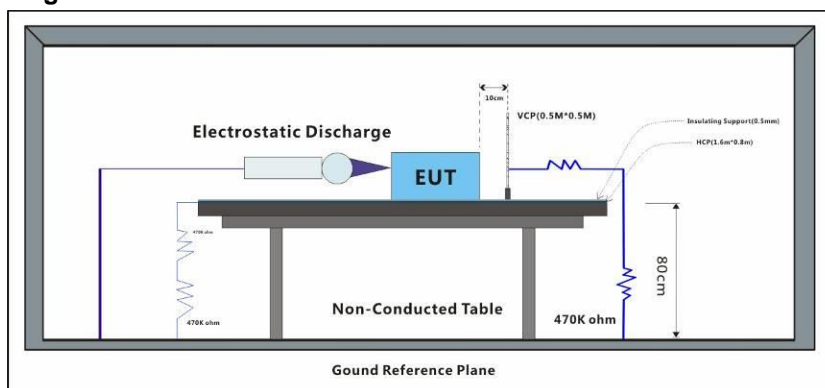
### Results:

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

## 7.5 Electrostatic Discharge

Test Requirement: EN 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

### 7.5.1 Test Setup Diagram



### 7.5.2 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 continually.

### 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	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.

## 7.6 Electrostatic Discharge

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

Test Method: EN 61000-4-2:2009

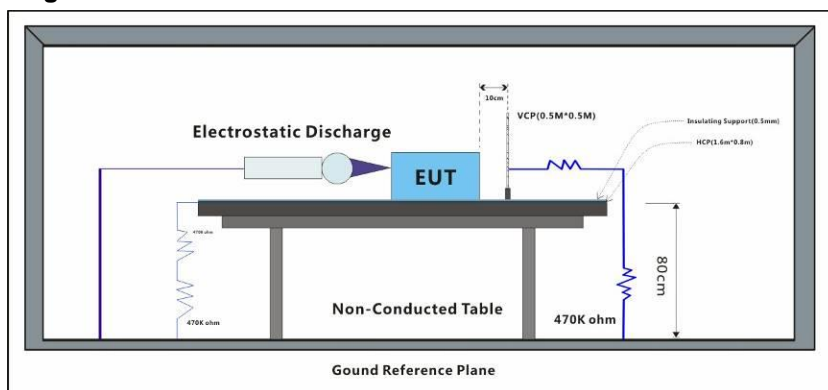
Number of Discharge: Minimum 10 times at each test point for Air Discharge  
Minimum 50 times at each test point for Contact or VCP & HCP Discharge

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

### 7.6.1 Test Setup Diagram



### 7.6.2 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 continually.

### 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	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

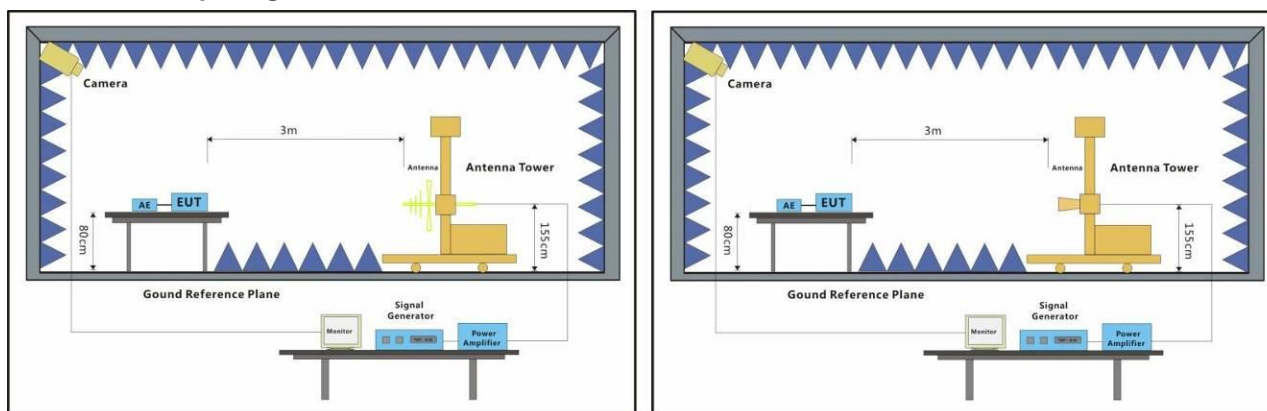
### Results:

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

## 7.7 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: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

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

### 7.7.3 Test Results:

Frequency	Level (V/m)	EUT Face	Dwell time	Result / Observations
80MHz-1GHz	3	Front	2s	A
80MHz-1GHz	3	Back	2s	A
80MHz-1GHz	3	Left	2s	A
80MHz-1GHz	3	Right	2s	A
80MHz-1GHz	3	Top	2s	A
80MHz-1GHz	3	Underside	2s	A
1800MHz	3	Front	2s	A
1800MHz	3	Back	2s	A
1800MHz	3	Left	2s	A
1800MHz	3	Right	2s	A
1800MHz	3	Top	2s	A
1800MHz	3	Underside	2s	A
2600MHz	3	Front	2s	A
2600MHz	3	Back	2s	A
2600MHz	3	Left	2s	A
2600MHz	3	Right	2s	A
2600MHz	3	Top	2s	A
2600MHz	3	Underside	2s	A
3500MHz	3	Front	2s	A
3500MHz	3	Back	2s	A



3500MHz	3	Left	2s	A
3500MHz	3	Right	2s	A
3500MHz	3	Top	2s	A
3500MHz	3	Underside	2s	A
5000MHz	3	Front	2s	A
5000MHz	3	Back	2s	A
5000MHz	3	Left	2s	A
5000MHz	3	Right	2s	A
5000MHz	3	Top	2s	A
5000MHz	3	Underside	2s	A

**Results:**

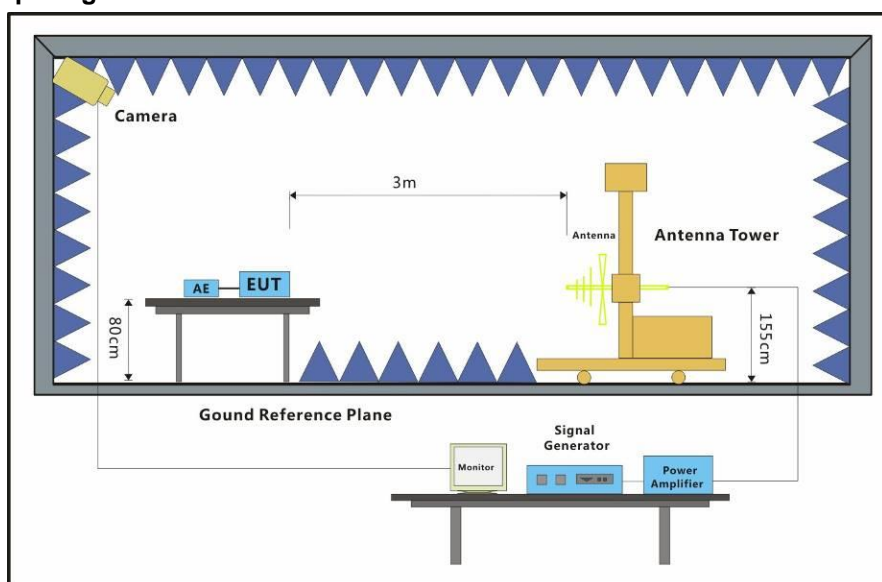
A: No degradation in the performance of the EUT was observed.



## 7.8 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

### 7.8.1 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 continually.

### 7.8.3 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
80MHz-2.7GHz	10	Top	3s	A
80MHz-2.7GHz	10	Underside	3s	A

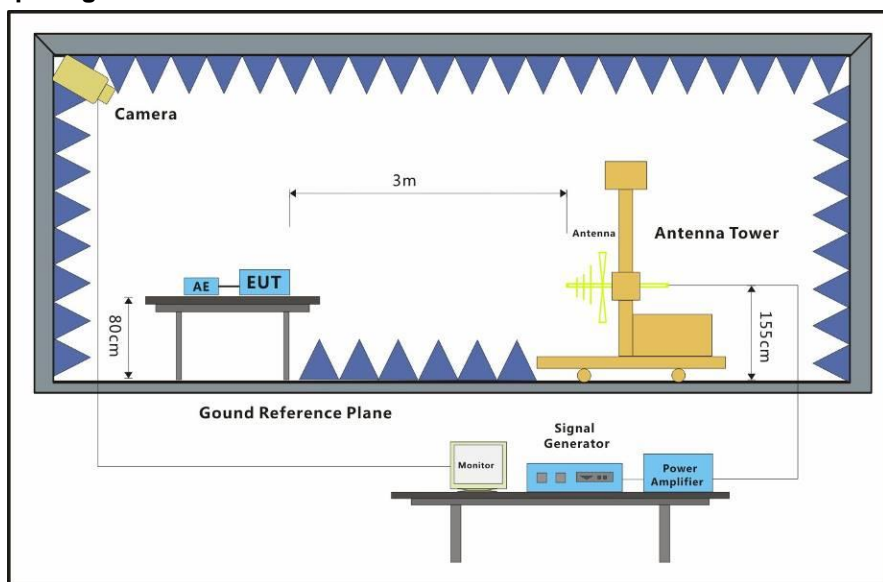
### Results:

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

## 7.9 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

### 7.9.1 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 continually.

### 7.9.3 Test Results:

Frequency	Level (V/m)	EUT Face	Dwell time	Result / Observations
80MHz-1GHz	3	Front	2s	A
80MHz-1GHz	3	Back	2s	A
80MHz-1GHz	3	Left	2s	A
80MHz-1GHz	3	Right	2s	A
80MHz-1GHz	3	Top	2s	A
80MHz-1GHz	3	Underside	2s	A

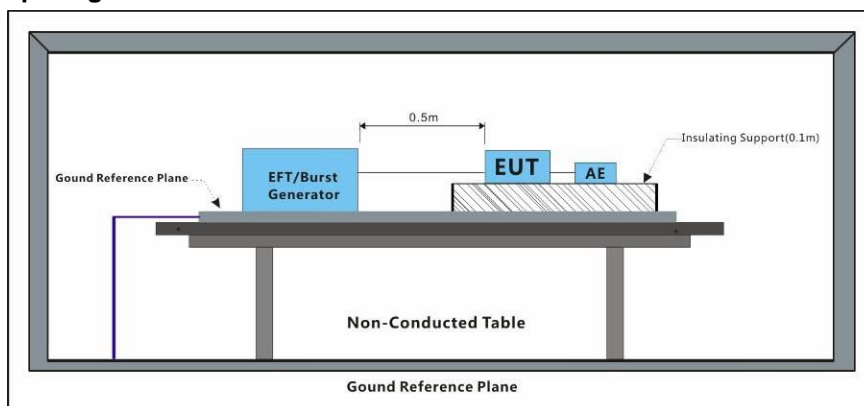
#### Results:

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

## 7.10 Electrical Fast Transients/Burst at Power Port

Test Requirement: EN 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

### 7.10.1 Test Setup Diagram



### 7.10.2 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 continually.

### 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

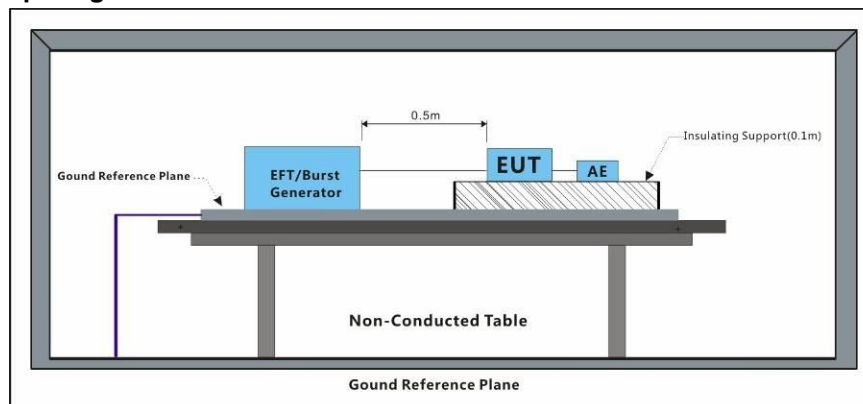
Test Method: EN 61000-4-4:2012

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: 48 % RH Atmospheric Pressure: 1010 mbar

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

### 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

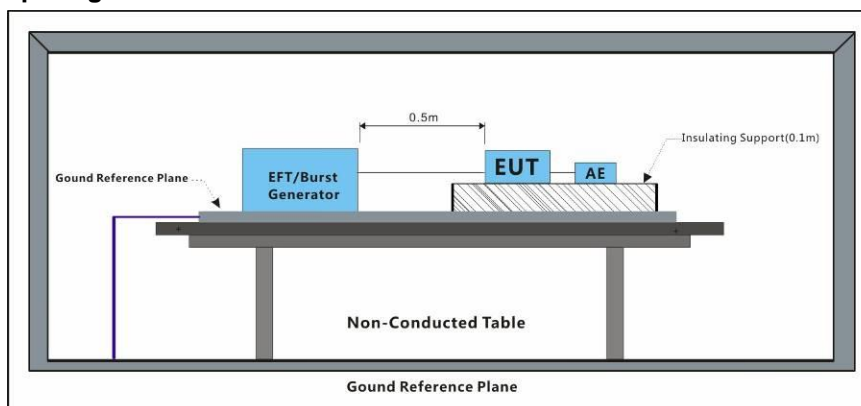
#### Results:

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

## 7.12 Electrical Fast Transients/Burst at Power Port

Test Requirement: EN 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

### 7.12.1 Test Setup Diagram



### 7.12.2 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 continually.

### 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

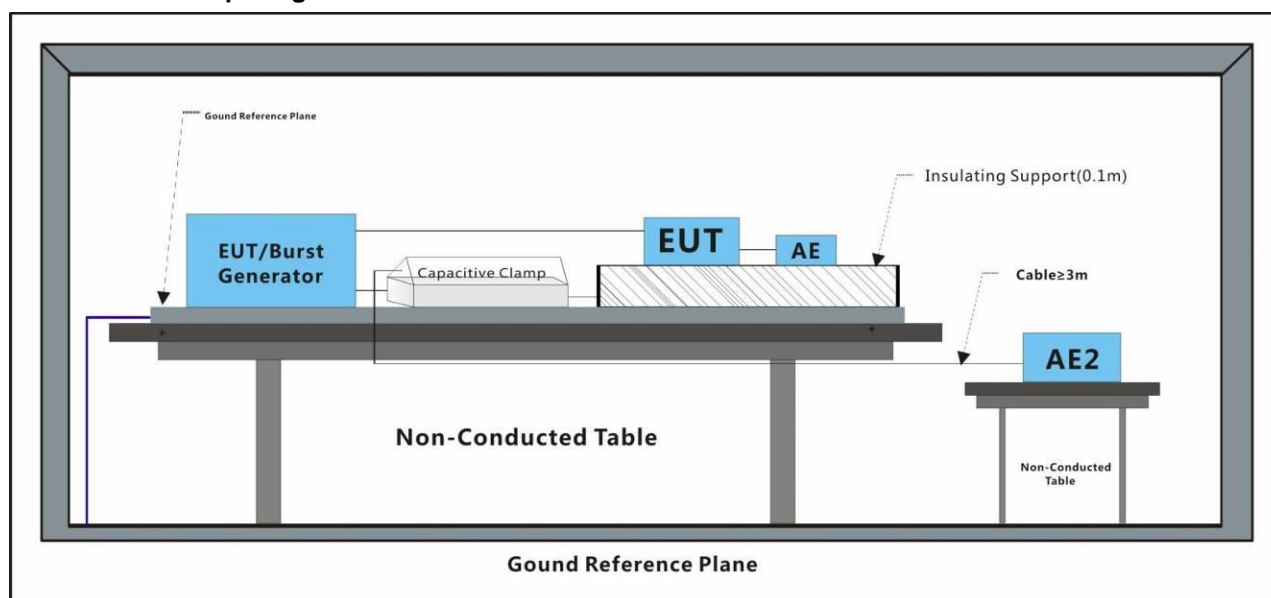
#### Results:

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: 48 % RH Atmospheric Pressure: 1010 mbar  
 Test mode: a: keep EUT monitoring and data running continually.

#### 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

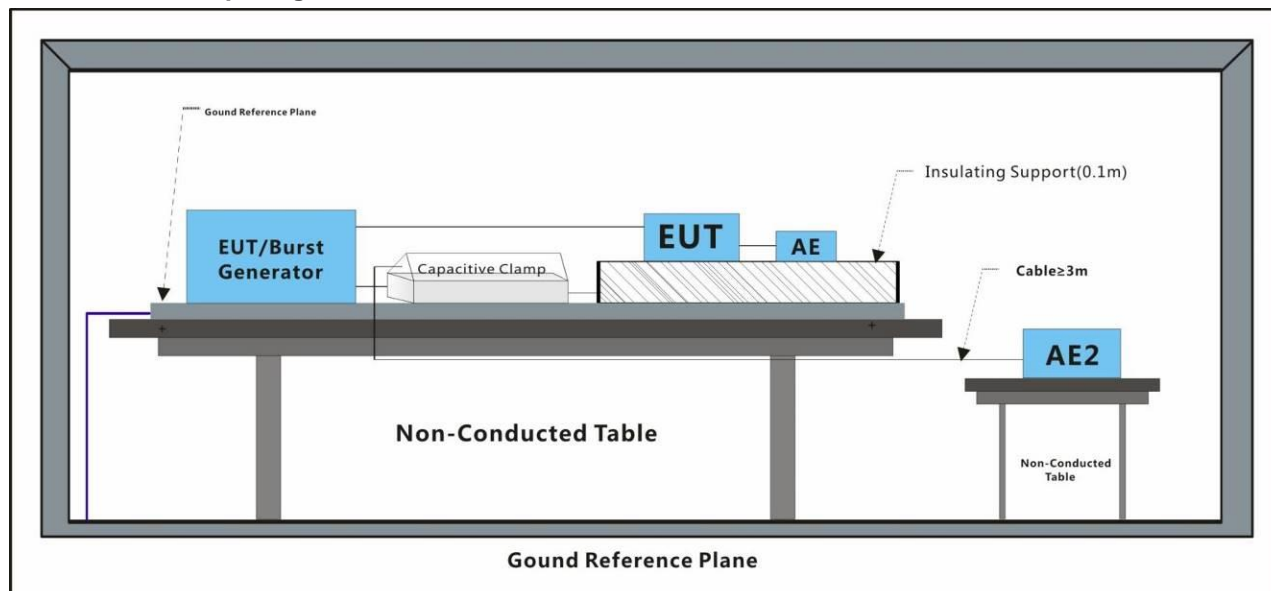
Test Method: EN 61000-4-4:2012

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: 48 % RH Atmospheric Pressure: 1010 mbar

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

### 7.14.3 Test Results:

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

#### Results:

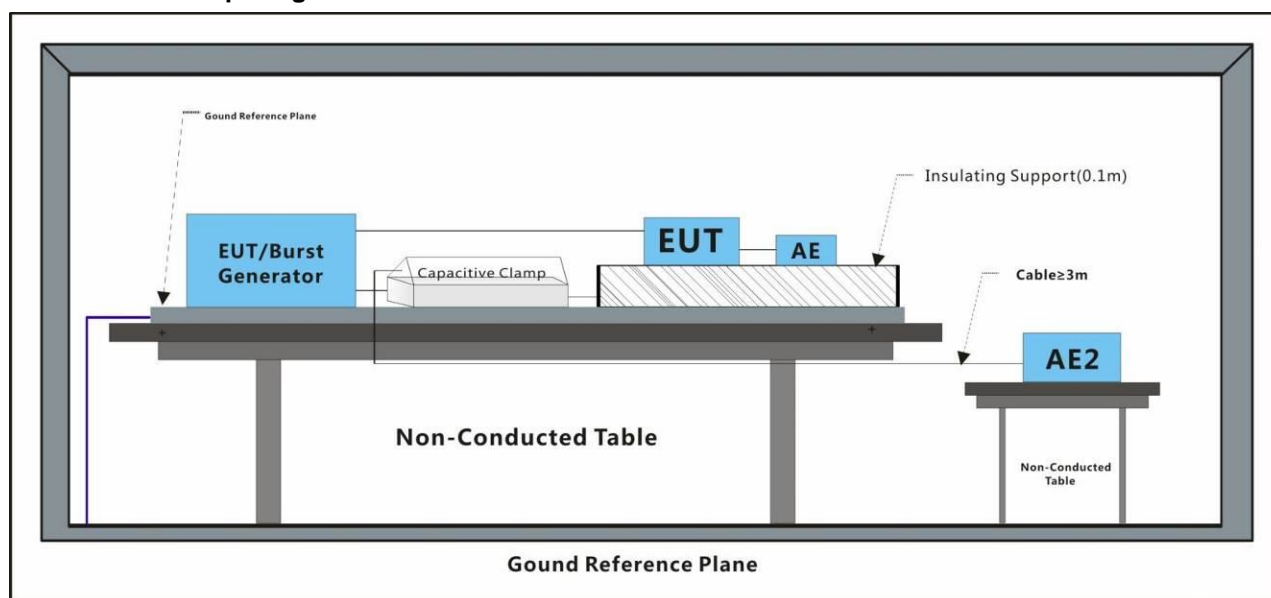
A: No degradation in the performance of the EUT was observed.



## 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: 48 % RH Atmospheric Pressure: 1010 mbar  
 Test mode: a: keep EUT monitoring and data running continually.

### 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

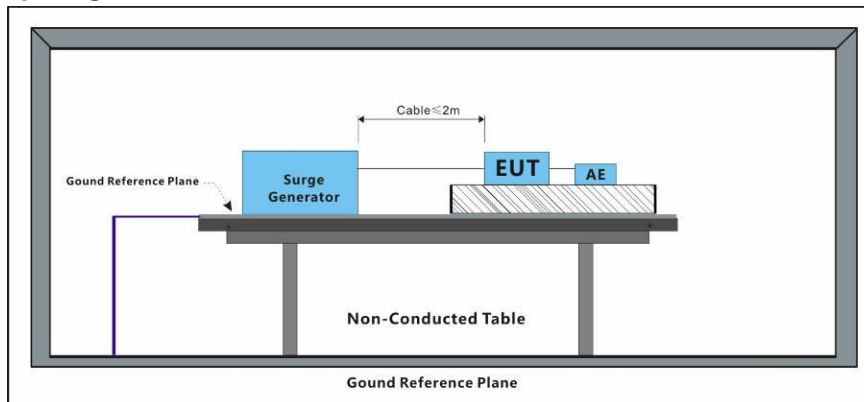
#### Results:

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

## 7.16 Surge at Power Port

Test Requirement: EN 55035:2017  
Test Method: EN 61000-4-5:2014 +A1:2017  
Performance Criterion: B  
Interval: 60s between each surge  
No. of surges: 5 positive, 5 negative at 90°, 270°

### 7.16.1 Test Setup Diagram



### 7.16.2 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 continually.

### 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
L-PE	2	+	0°	A
L-PE	2	-	0°	A
L-PE	2	+	90°	A
L-PE	2	-	90°	A
L-PE	2	+	180°	A
L-PE	2	-	180°	A
L-PE	2	+	270°	A
L-PE	2	-	270°	A
N-PE	2	+	0°	A
N-PE	2	-	0°	A
N-PE	2	+	90°	A
N-PE	2	-	90°	A
N-PE	2	+	180°	A



N-PE	2	-	180°	A
N-PE	2	+	270°	A
N-PE	2	-	270°	A

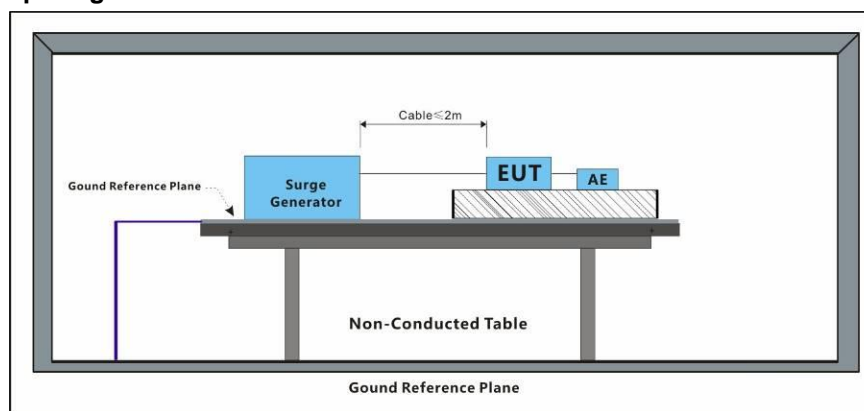
**Results:**

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 +A1:2017
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: 48 % RH Atmospheric Pressure: 1010 mbar

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

### 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
L-PE	0.5,1,2	+	0°	A
L-PE	0.5,1,2	-	0°	A
L-PE	0.5,1,2	+	90°	A
L-PE	0.5,1,2	-	90°	A
L-PE	0.5,1,2	+	180°	A
L-PE	0.5,1,2	-	180°	A
L-PE	0.5,1,2	+	270°	A
L-PE	0.5,1,2	-	270°	A
N-PE	0.5,1,2	+	0°	A
N-PE	0.5,1,2	-	0°	A



N-PE	0.5,1,2	+	90°	A
N-PE	0.5,1,2	-	90°	A
N-PE	0.5,1,2	+	180°	A
N-PE	0.5,1,2	-	180°	A
N-PE	0.5,1,2	+	270°	A
N-PE	0.5,1,2	-	270°	A

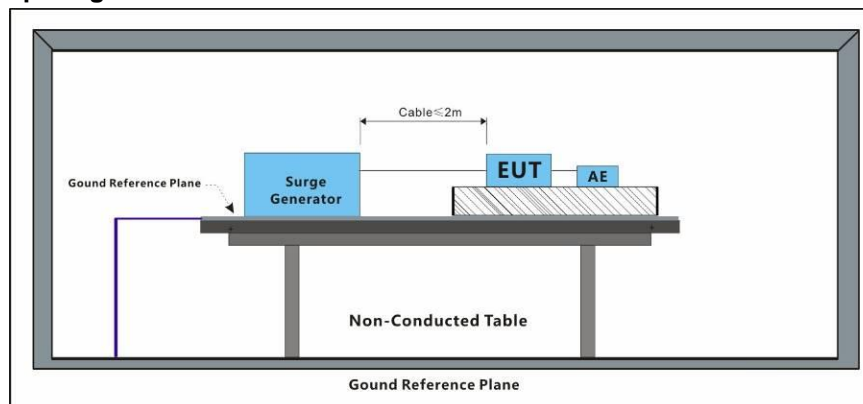
**Results:**

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

## 7.18 Surge at Power Port

Test Requirement: EN 55024:2010 +A1:2015  
 Test Method: EN 61000-4-5:2014 +A1:2017  
 Performance Criterion: B  
 Interval: 60s between each surge  
 No. of surges: 5 positive, 5 negative at 0°, 90°, 180°, 270°.

### 7.18.1 Test Setup Diagram



### 7.18.2 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 continually.

### 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
L-PE	2	+	0°	A
L-PE	2	-	0°	A
L-PE	2	+	90°	A
L-PE	2	-	90°	A
L-PE	2	+	180°	A
L-PE	2	-	180°	A
L-PE	2	+	270°	A
L-PE	2	-	270°	A
N-PE	2	+	0°	A
N-PE	2	-	0°	A
N-PE	2	+	90°	A
N-PE	2	-	90°	A
N-PE	2	+	180°	A



N-PE	2	-	180°	A
N-PE	2	+	270°	A
N-PE	2	-	270°	A

**Results:**

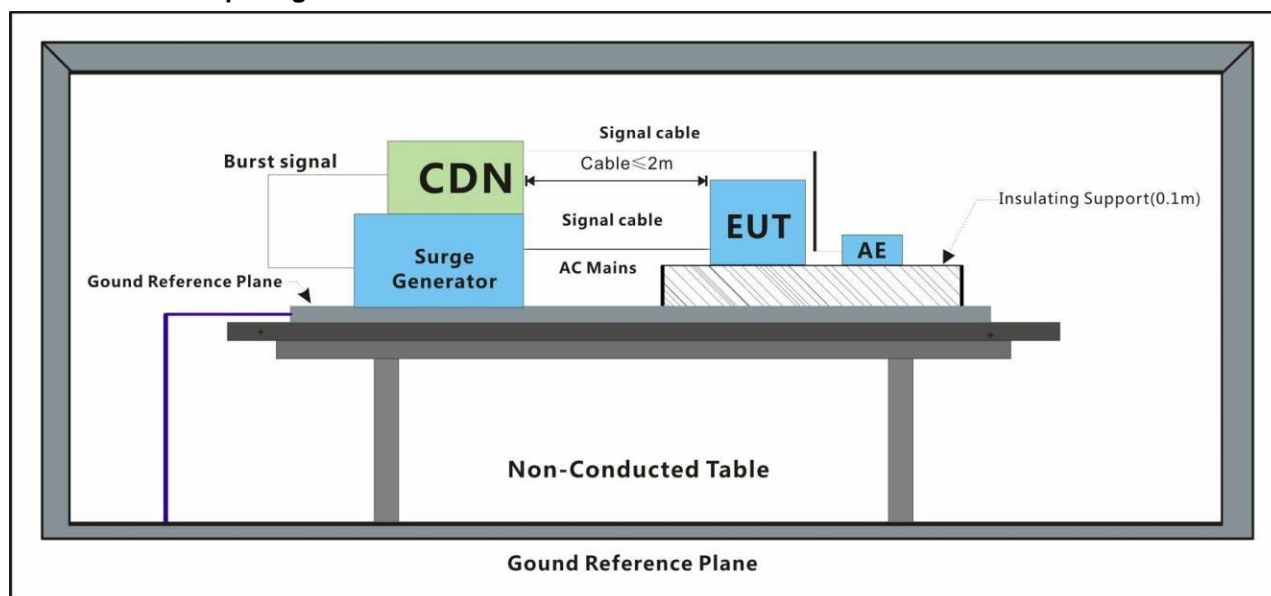
A: No degradation in the performance of the EUT was observed.



## 7.19 Surge at Signal Port

Test Requirement: EN 55024:2010 +A1:2015  
 Test Method: EN 61000-4-5:2014 +A1:2017  
 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: 48 % RH Atmospheric Pressure: 1010 mbar  
 Test mode: a: keep EUT monitoring and data running continually.

### 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:

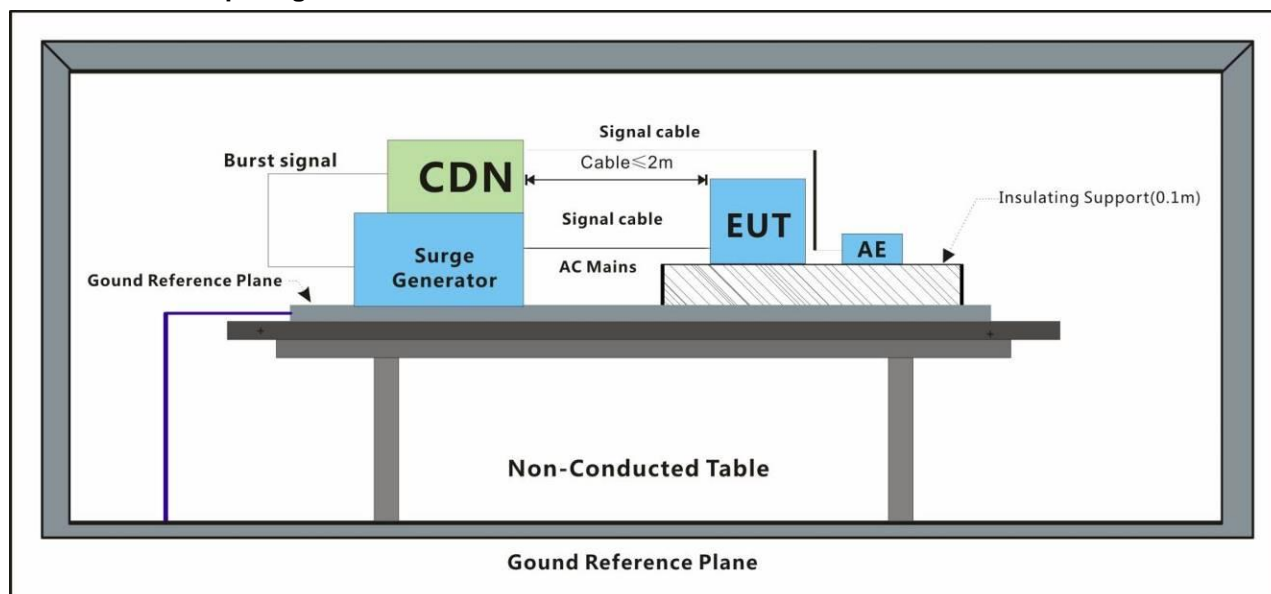
A: No degradation in the performance of the EUT was observed.

## 7.20 Surge at Signal Port

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

Test Method: EN 61000-4-5:2014 +A1:2017

### 7.20.1 Test Setup Diagram



### 7.20.2 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 continually.

### 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

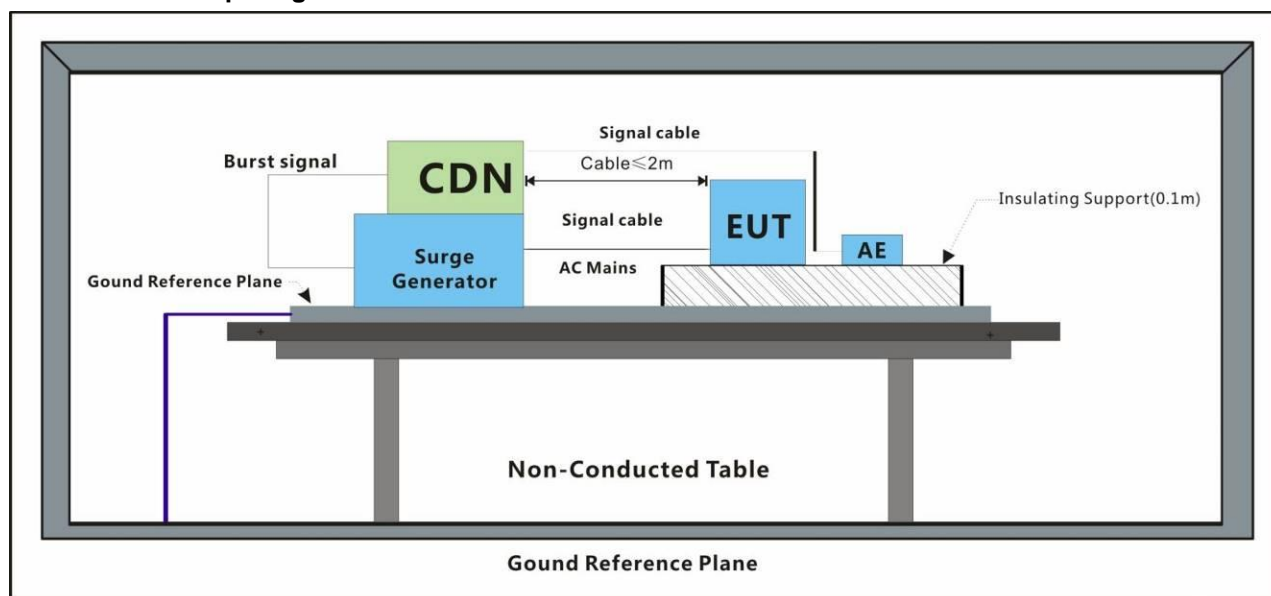
#### Results:

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 +A1:2017  
 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: 48 % RH Atmospheric Pressure: 1010 mbar  
 Test mode: a: keep EUT monitoring and data running continually.

### 7.21.3 Test Results:

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

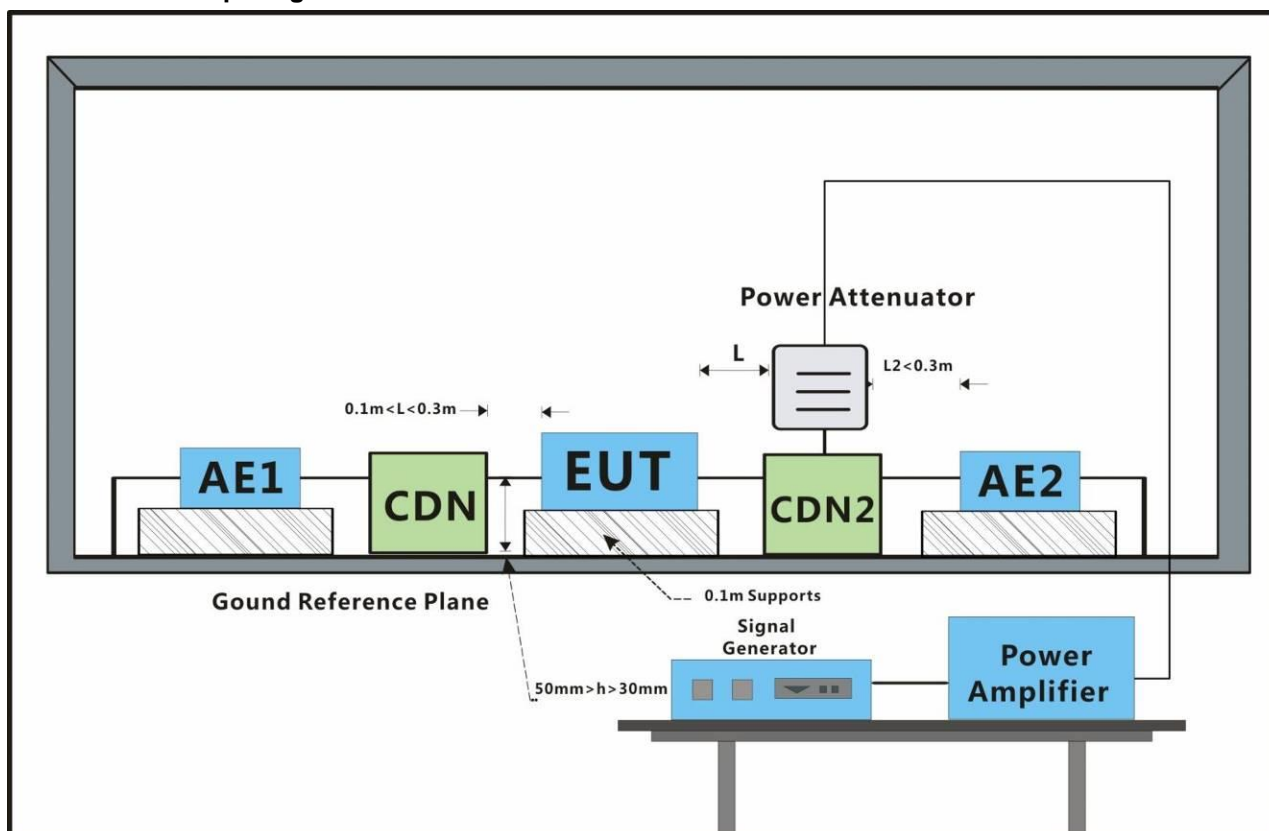
#### Results:

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

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

Test Requirement: EN 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%

### 7.22.1 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 continually.

### 7.22.3 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

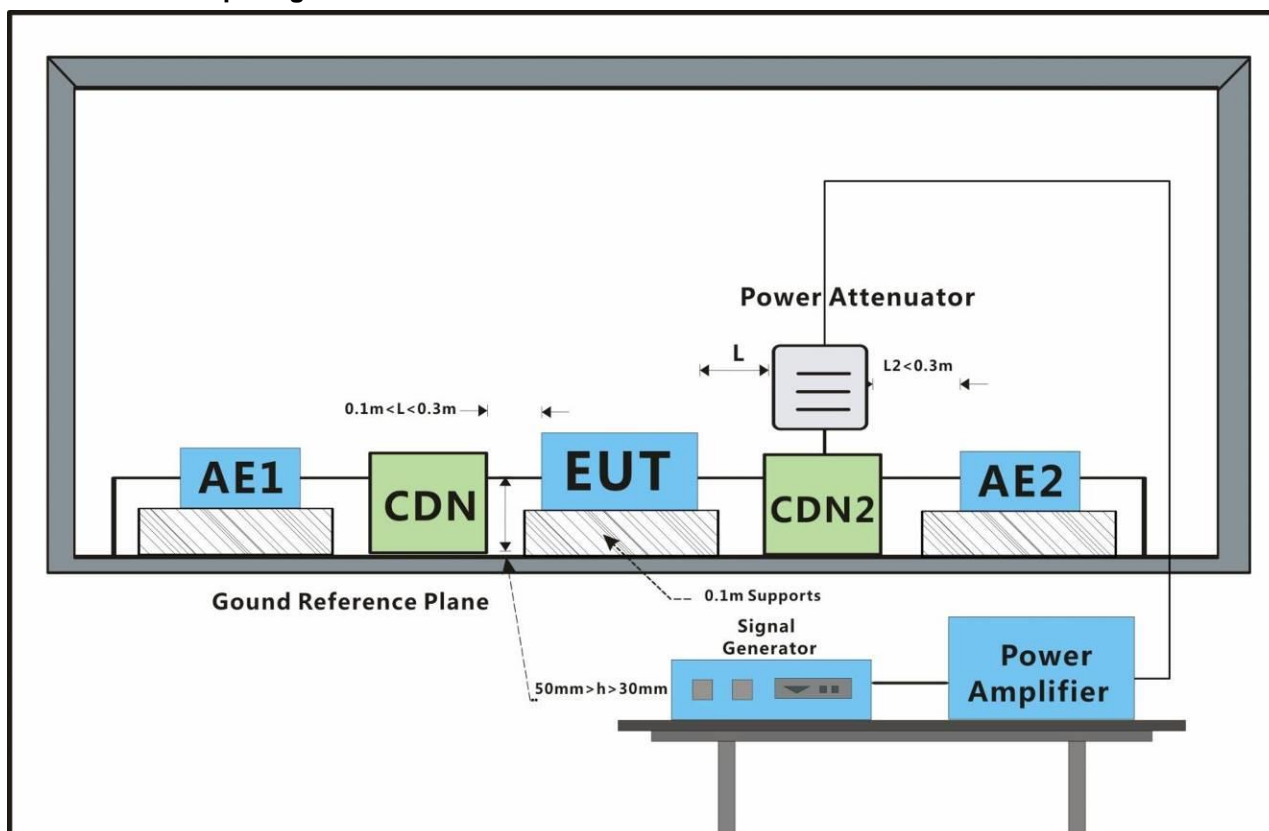
### Results:

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

## 7.23 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%

### 7.23.1 Test Setup Diagram



### 7.23.2 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 continually.

### 7.23.3 Test Results:

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

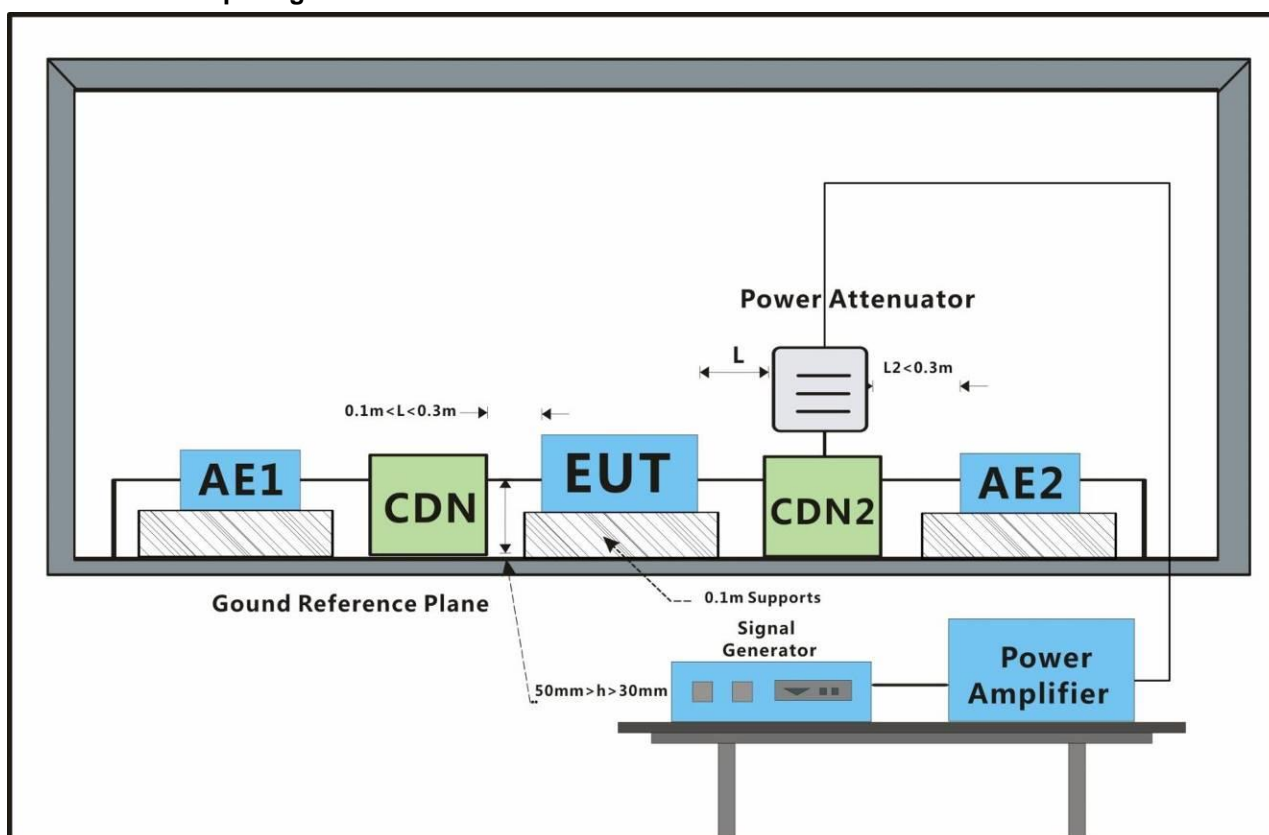
#### Results:

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

## 7.24 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

### 7.24.1 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 continually.				

### 7.24.3 Test Results:

Cable port	Level (Vrms)	CDN/Clamp	Dwell time	Result / Observations
AC power port	10	CDN	2s	A

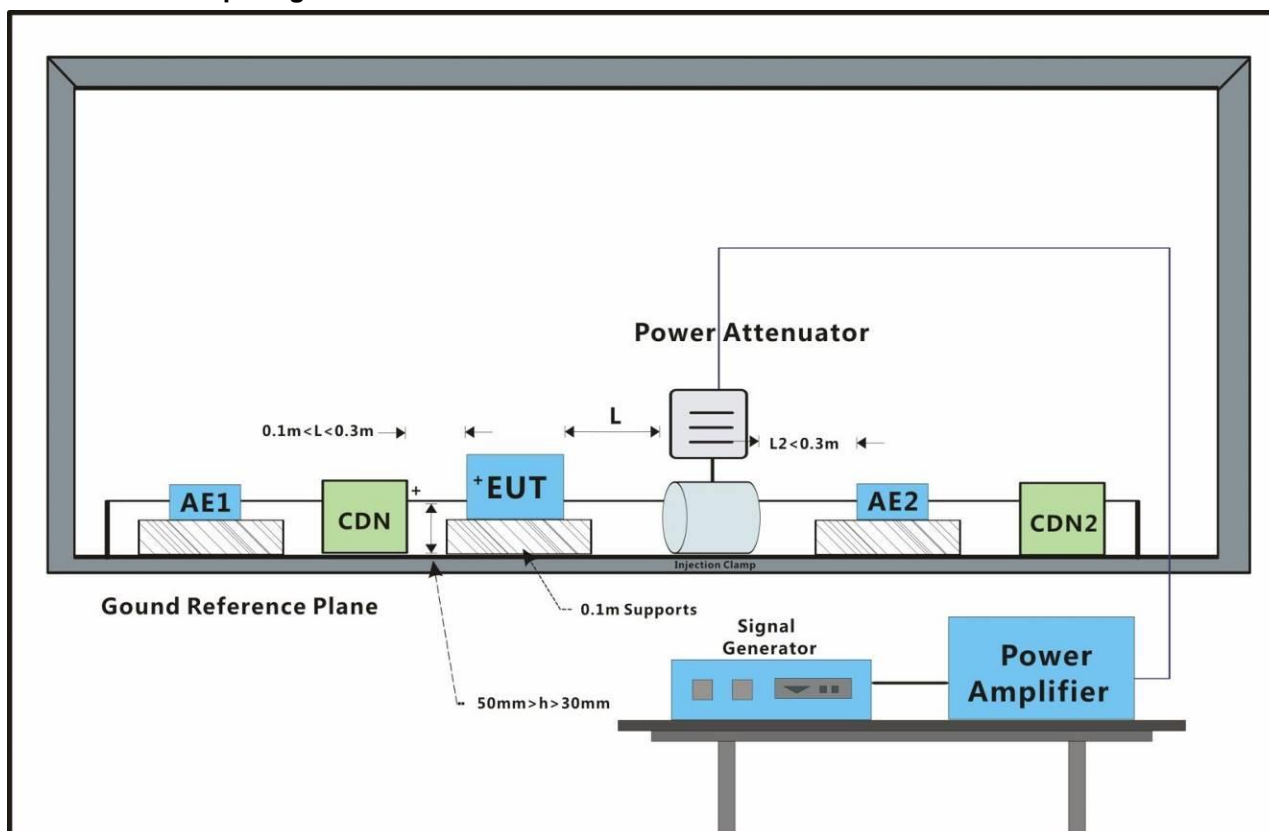
#### Results:

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

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

Test Requirement: EN 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%

### 7.25.1 Test Setup Diagram



### 7.25.2 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 continually.

### 7.25.3 Test Results:

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

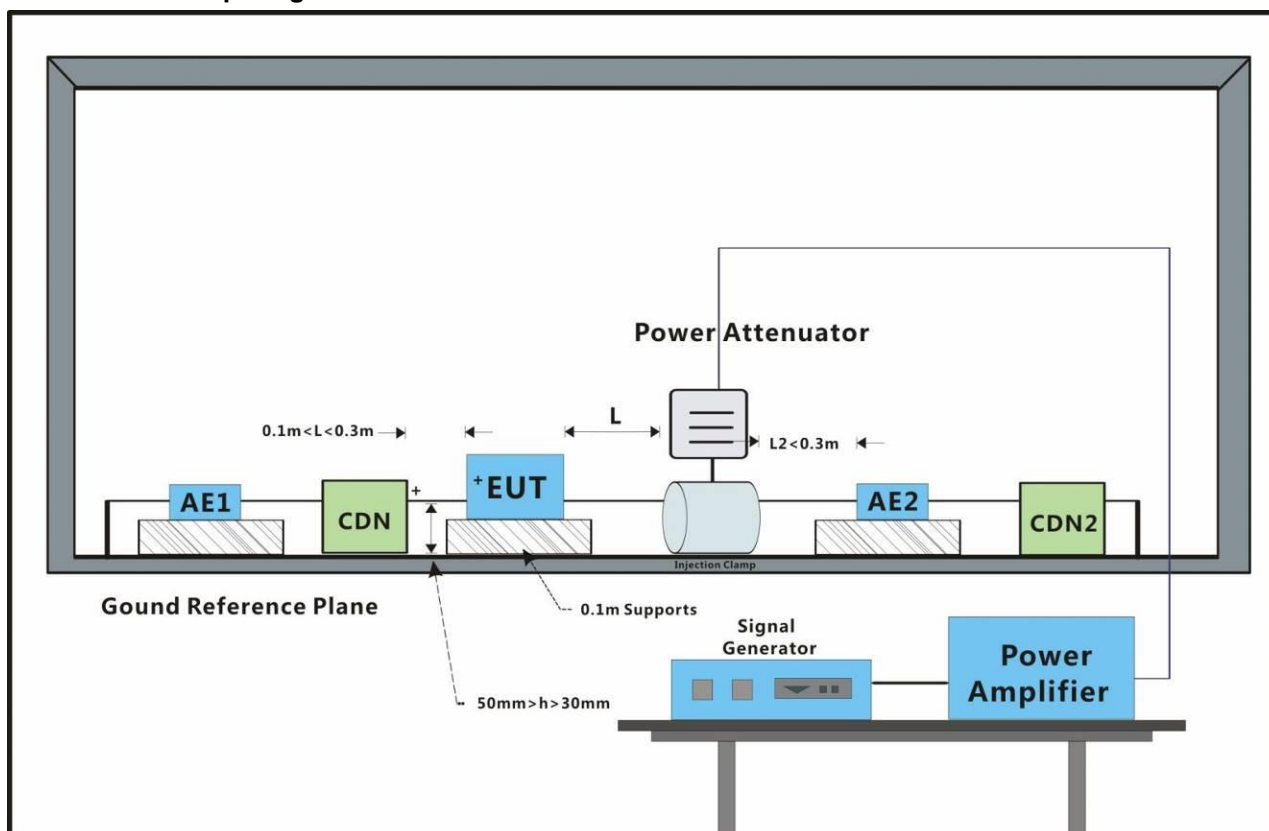
#### Results:

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

## 7.26 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%

### 7.26.1 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 continually.

### 7.26.3 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:

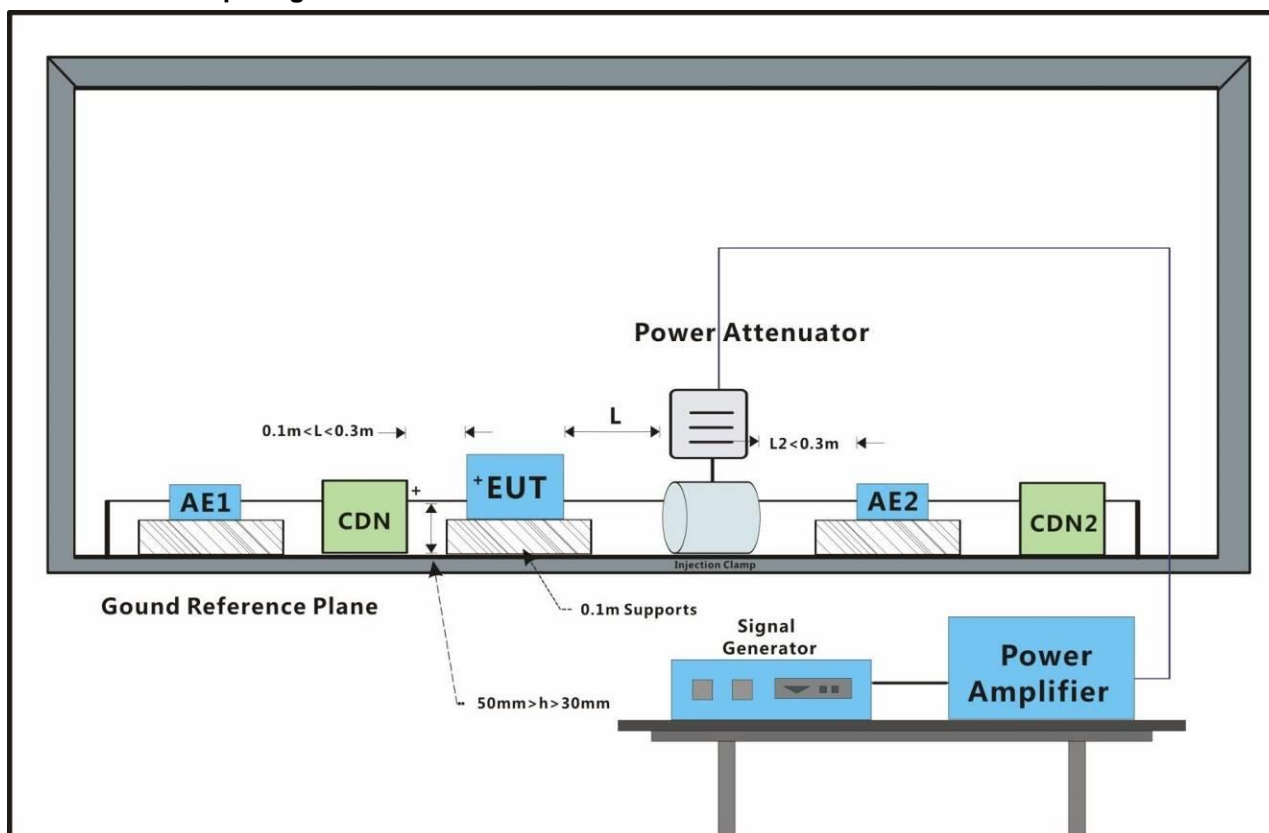
A: No degradation in the performance of the EUT was observed.



## 7.27 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 continually.

### 7.27.3 Test Results:

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

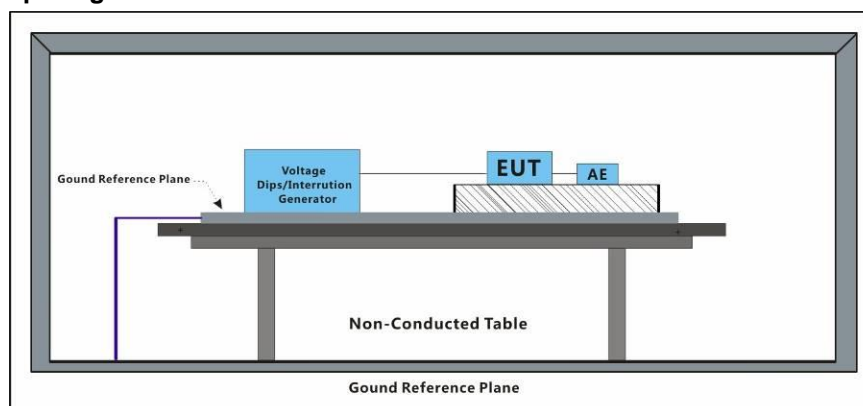
#### Results:

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 +A1:2017  
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: 48 % RH Atmospheric Pressure: 1010 mbar  
Test mode: a: keep EUT monitoring and data running continually.

### 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

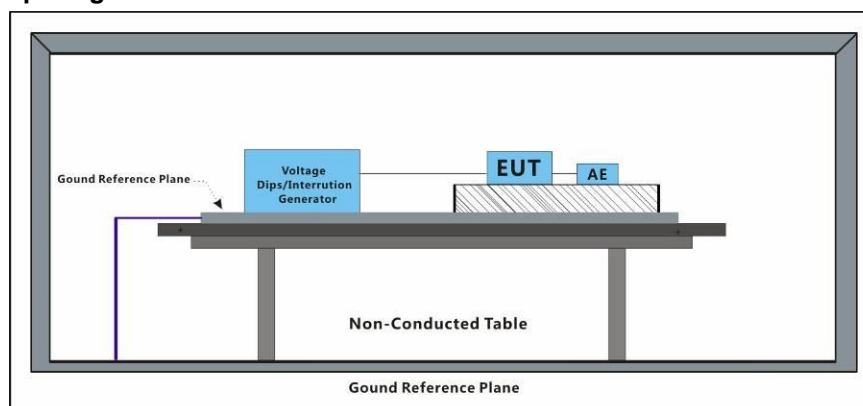
#### Results:

A: No degradation in the performance of the EUT was observed.  
C: During the 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 +A1:2017  
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: 48 % RH Atmospheric Pressure: 1010 mbar  
Test mode: a: keep EUT monitoring and data running continually.

### 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

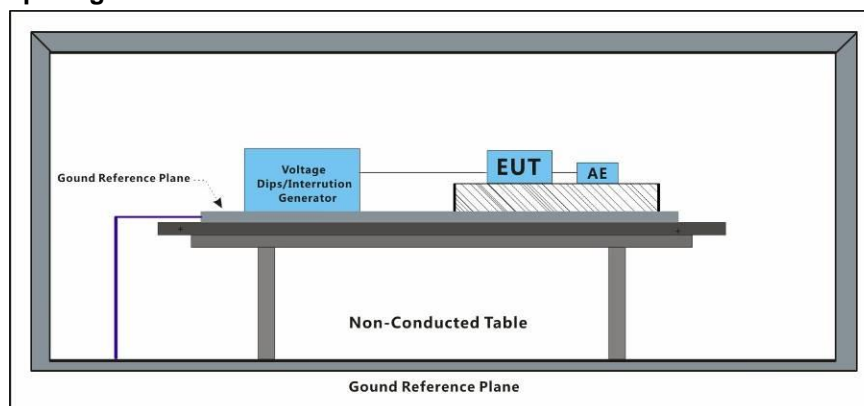
#### Results:

A: No degradation in the performance of the EUT was observed.  
C: During the 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 +A1:2017  
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: 22 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar

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

#### 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	C
70	0°	25 Cycles	3	A

#### Results:

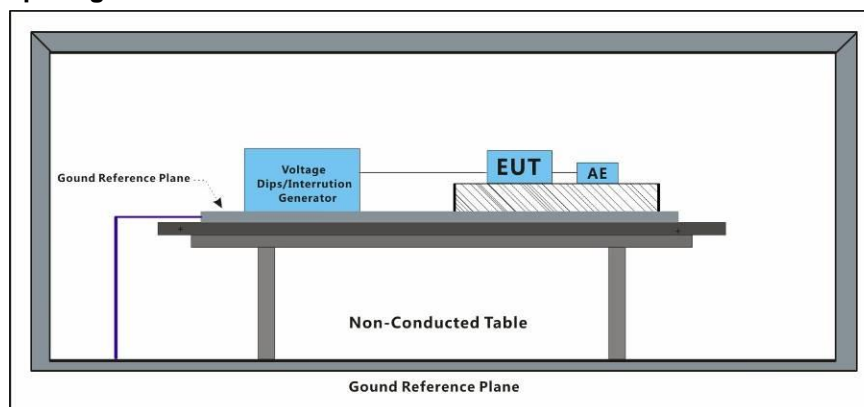
A: No degradation in the performance of the EUT was observed.

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

## 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 ( $U_{min}$ : $U_{nom} - 15\%$ )
Unom 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:	48 % RH	Atmospheric Pressure:	1010 mbar
Test mode:	a: keep EUT monitoring and data running continually.				

### 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



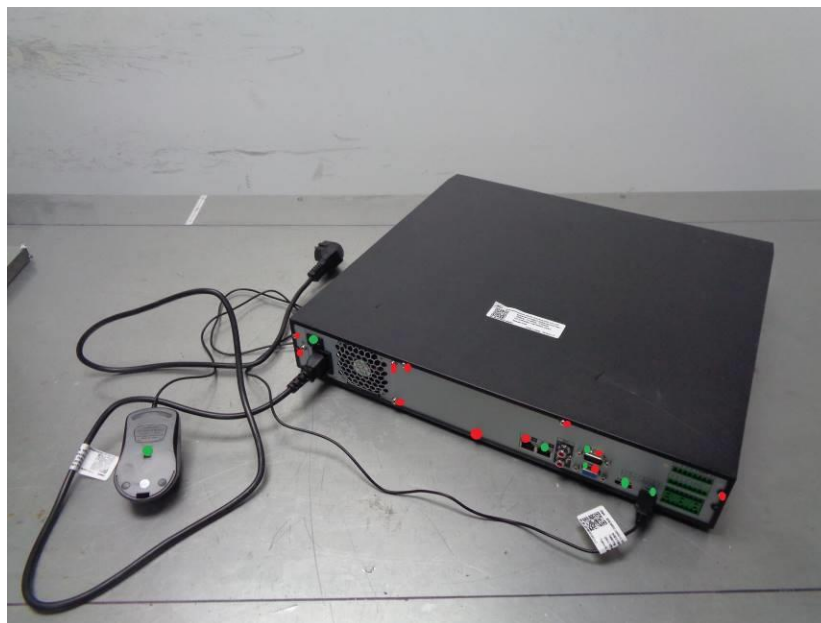
## 8.5 Harmonic & Voltage Fluctuations and Flicker Test Setup





## 8.6 Electrostatic Discharge Test Setup





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



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



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

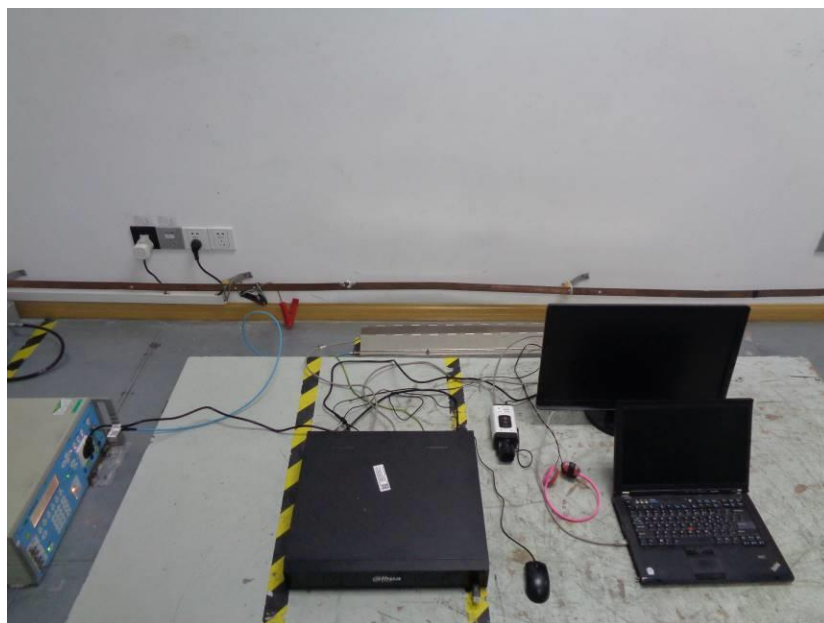




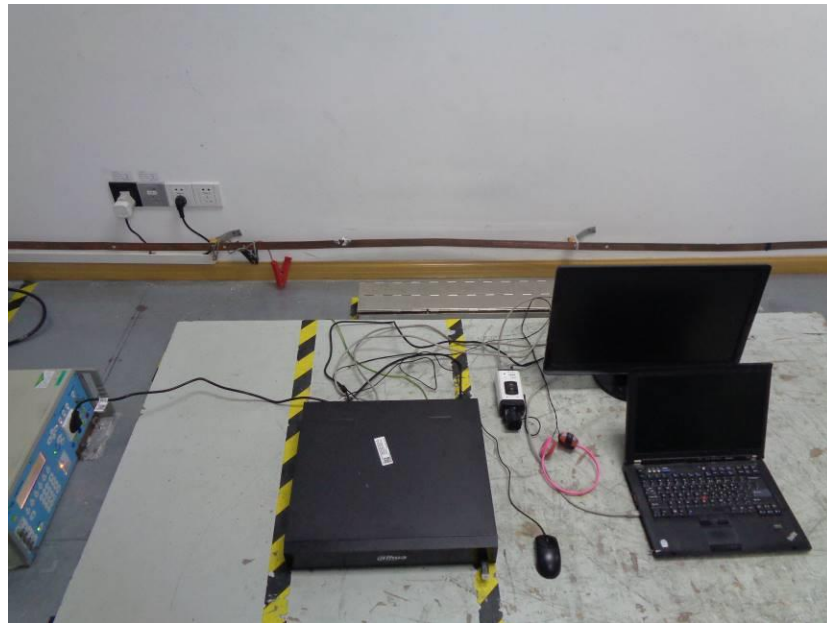
### 8.10 Electrical Fast Transients/Burst at Power Port Test Setup



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



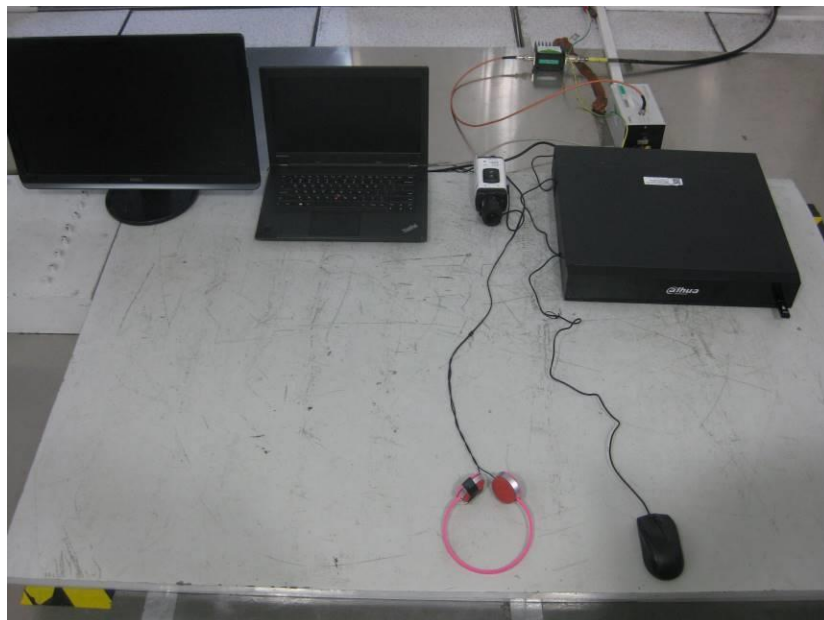
### 8.12 Surge at Power Port Test Setup



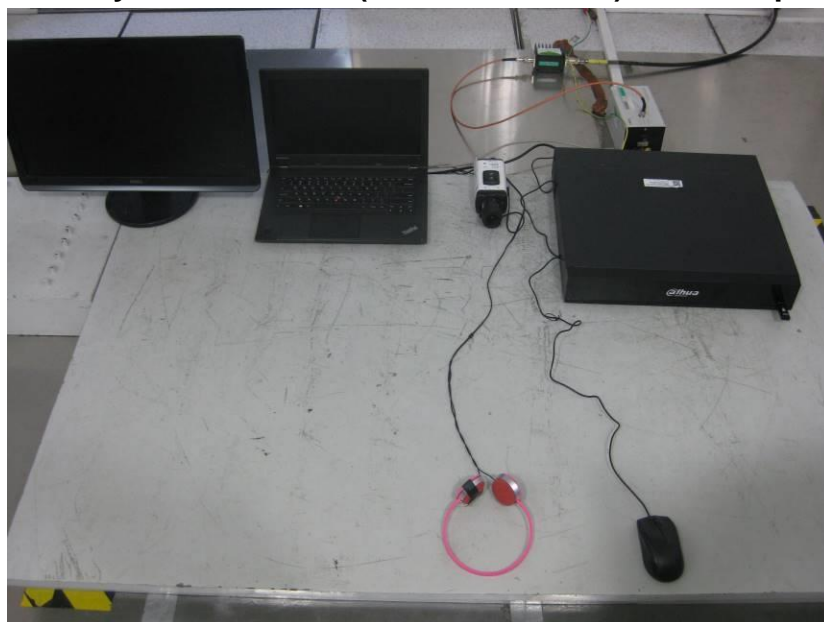
### 8.13 Surge at Signal Port Test Setup



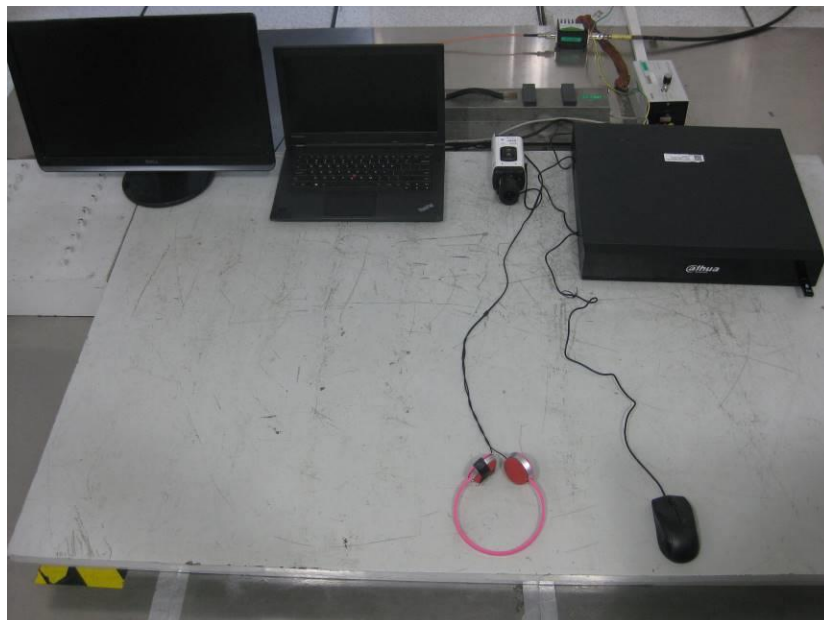
#### 8.14 Conducted Immunity at Power Port (150kHz-80MHz) Test Setup



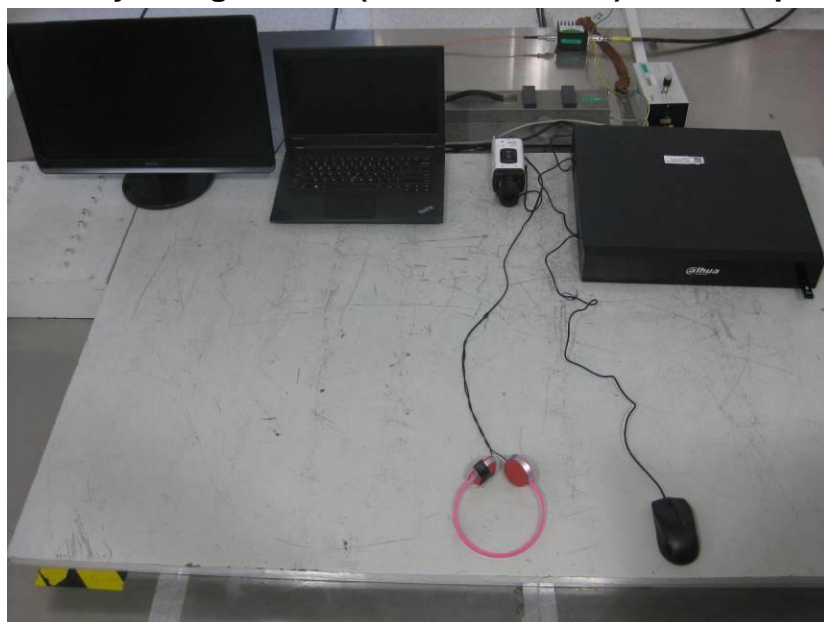
#### 8.15 Conducted Immunity at Power Port (150kHz-100MHz) Test Setup



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

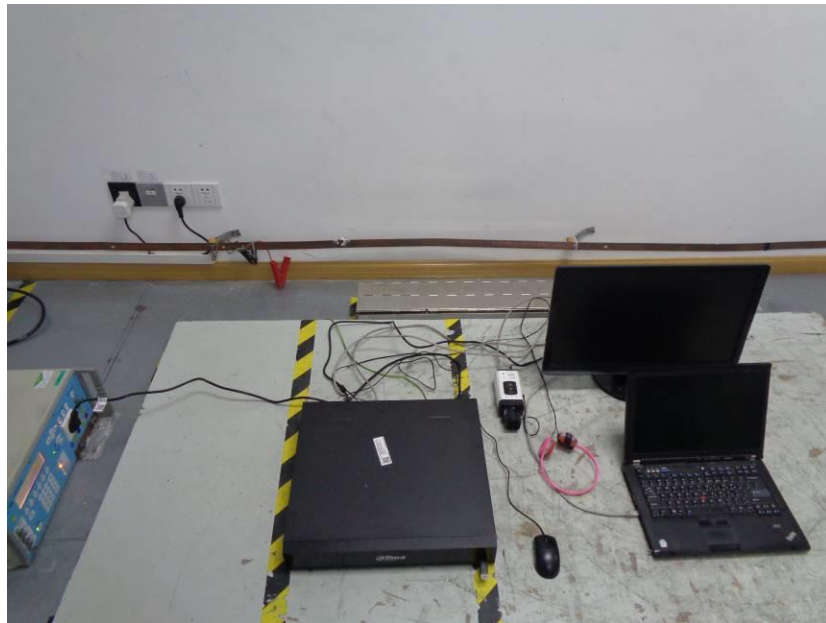


### 8.17 Conducted Immunity at Signal Port (150kHz-100MHz) Test Setup

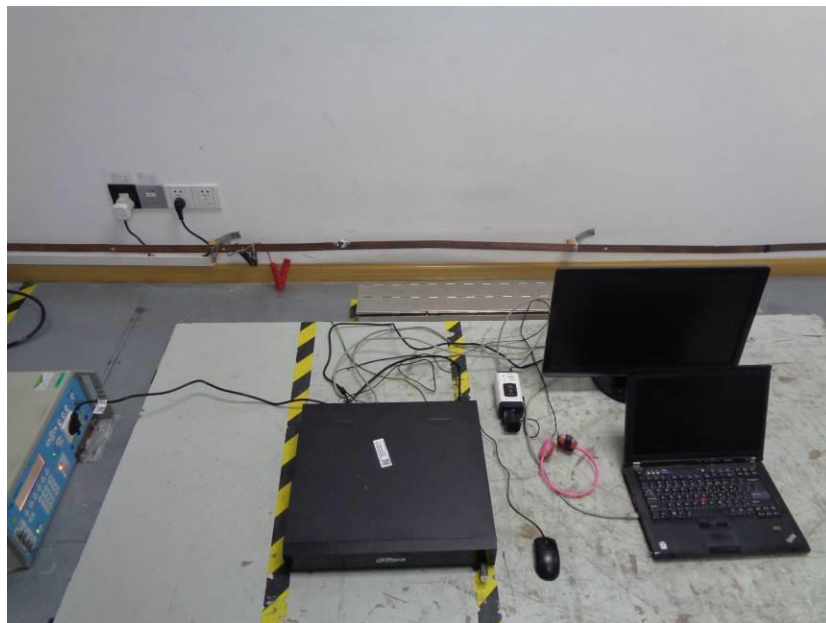




### 8.18 Voltage Dips and Interruptions Test Setup

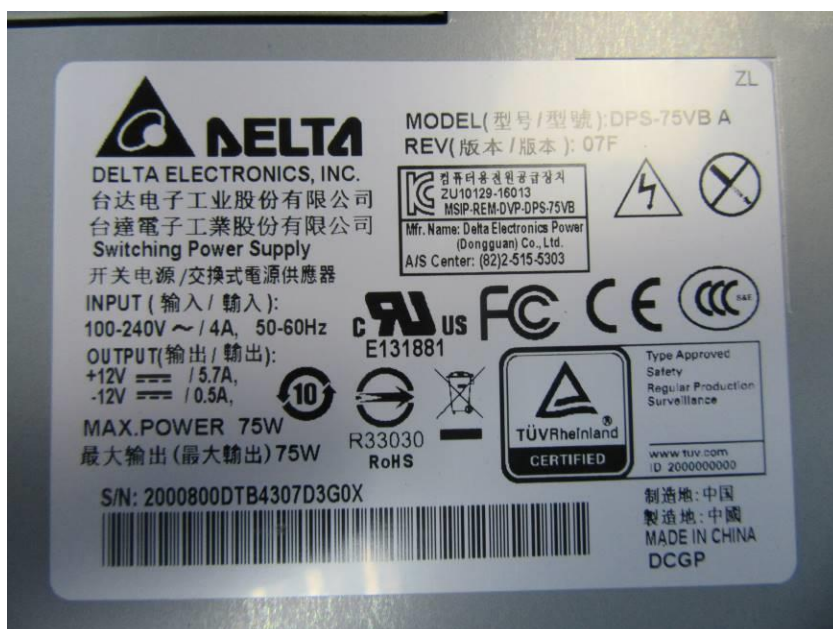


### 8.19 Mains Supply Voltage Variations-Conditioning Test Setup

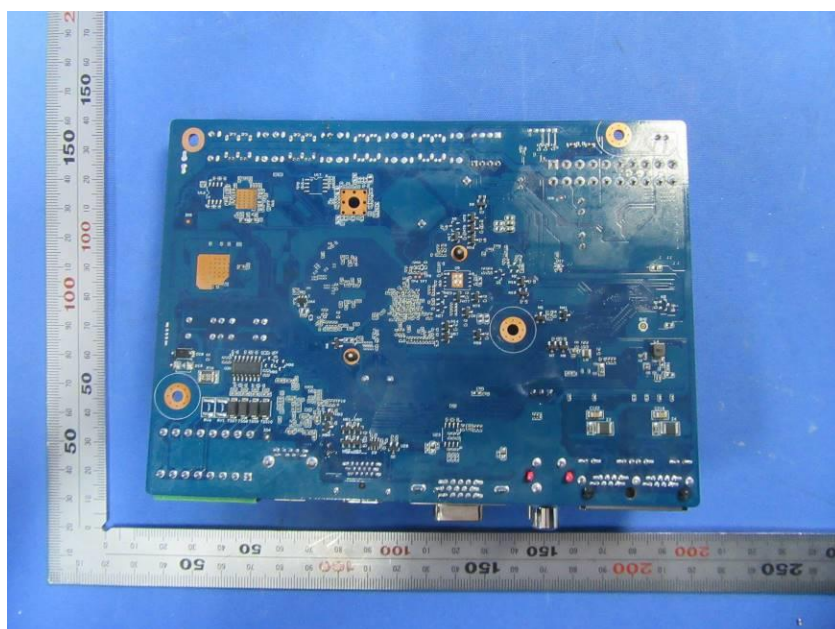
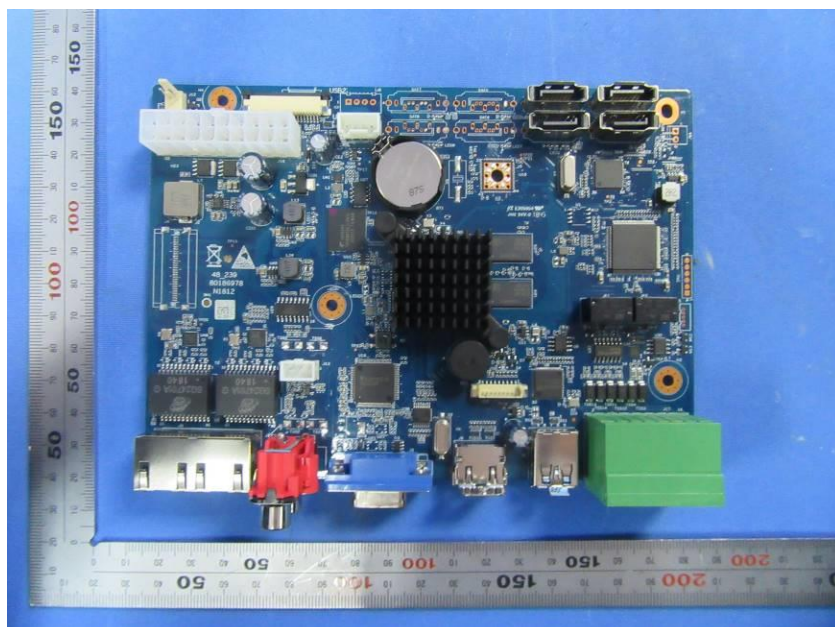


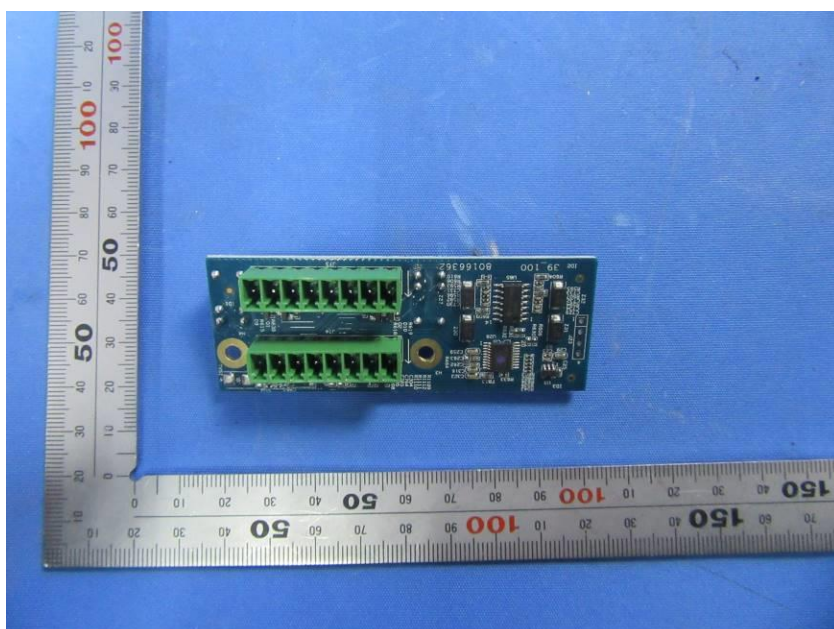
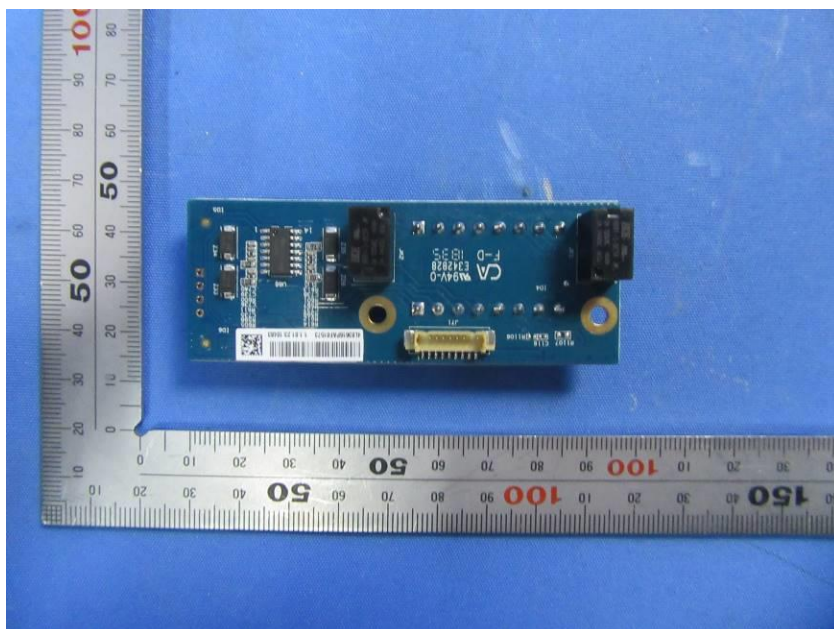
## 8.20 EUT Constructional Details (EUT Photos)



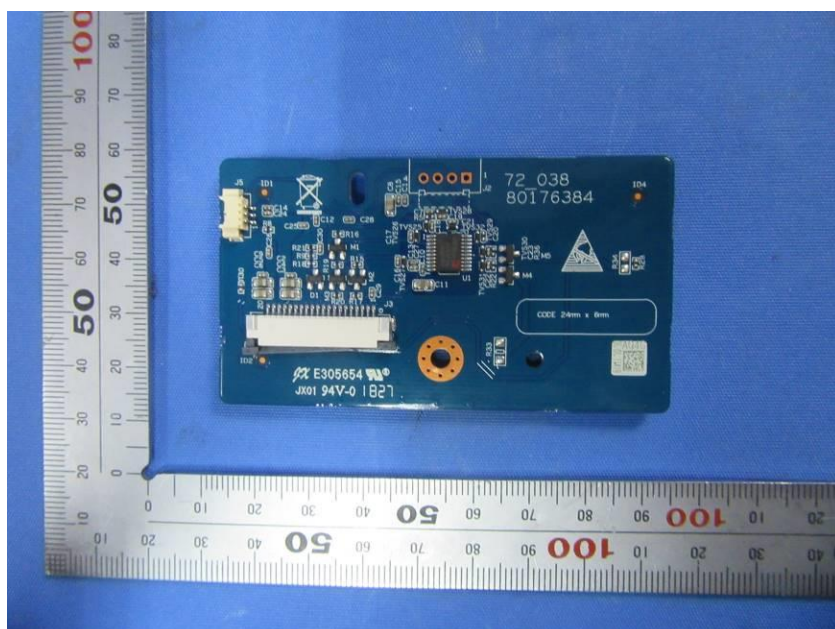
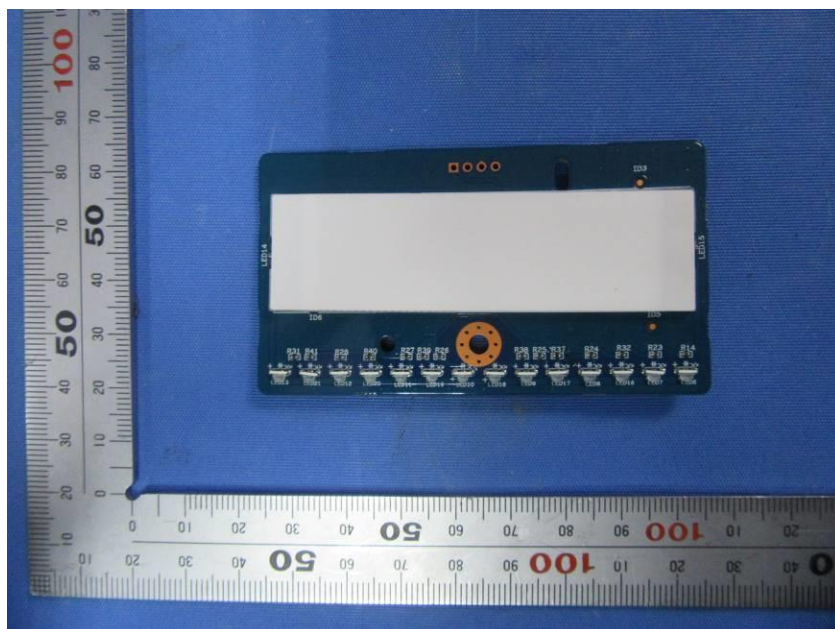


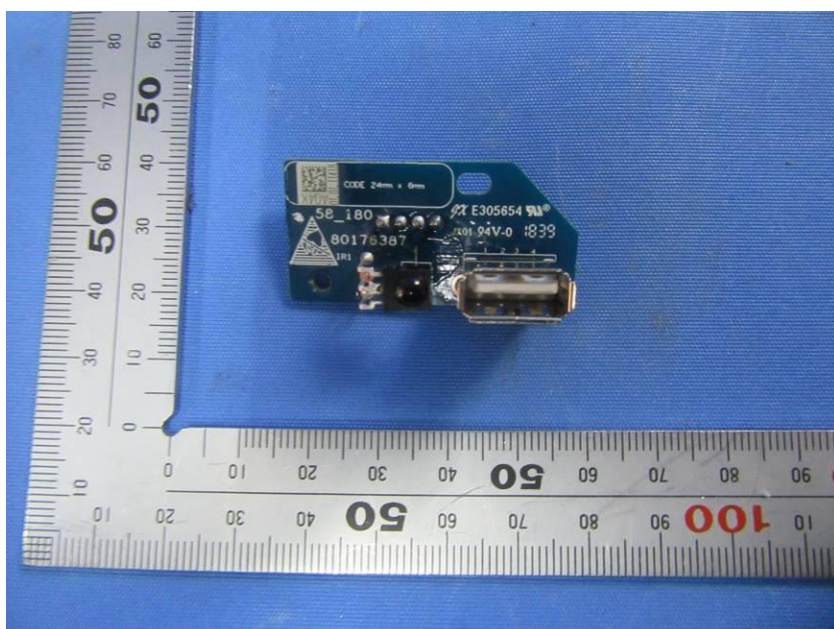
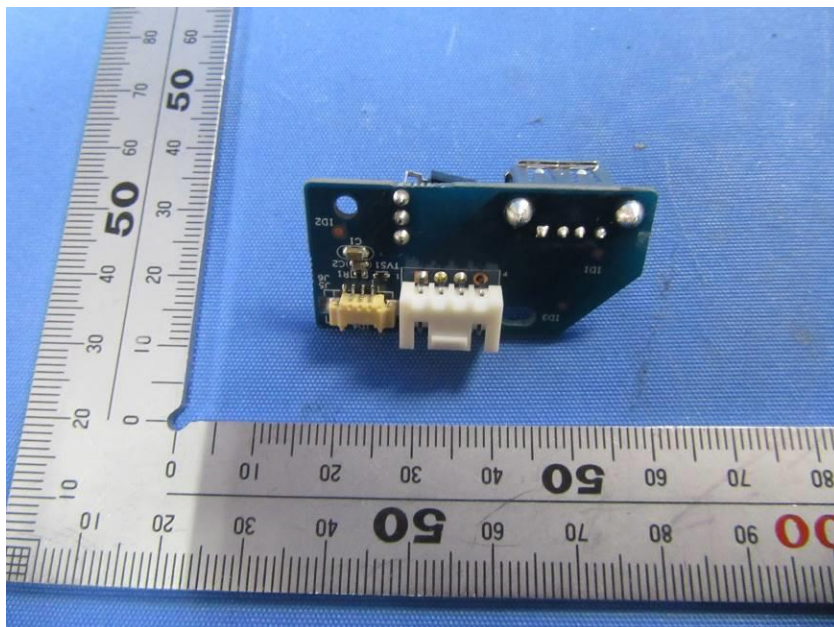














**- End of the Report -**