

EN 55032:2015+A11:2020

EN 55035:2017+A11:2020

EN IEC 61000-3-2:2019/A1:2021

EN 61000-3-3:2013+A1:2019

BS EN 55032:2015+A11:2020

BS EN 55035:2017+A11:2020

BS EN IEC 61000-3-2:2019/A1:2021

BS EN 61000-3-3:2013+A1:2019

## TEST REPORT

For

**SHENZHEN TENDA TECHNOLOGY CO.,LTD**

6-8 Floor, Tower E3, No. 1001, Zhongshanyuan Road, Nanshan District, Shenzhen, China. 518052

**Model: N6P-4H**

<b>Report Type:</b> Original Report	<b>Product Type:</b> PoE HD Network Video Recorder
<b>Report Number:</b>	DG2210719-29899E-01
<b>Report Date:</b>	2021-08-13
<b>Reviewed By:</b>	RedickZhang EMC Engineer
<b>Test Laboratory:</b>	Bay Area Compliance Laboratories Corp. (Dongguan) No.12, Pulong East 1 <sup>st</sup> Road, Tangxia Town, Dongguan, Guangdong, China Tel: +86-769-86858888 Fax: +86-769-86858891 <a href="http://www.baclcorp.com.cn">www.baclcorp.com.cn</a>

## **Table of Contents**

<b>General Information .....</b>	<b>4</b>
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT).....	4
OBJECTIVE .....	4
TEST METHODOLOGY .....	4
DECLARATIONS .....	5
<b>System Test Configuration .....</b>	<b>6</b>
DESCRIPTION OF TEST CONFIGURATION .....	6
EQUIPMENT MODIFICATIONS .....	6
EUT EXERCISE SOFTWARE .....	6
BLOCK DIAGRAM OF TEST SETUP .....	6
SUPPORT EQUIPMENT LIST AND DETAILS .....	7
SUPPORT CABLE LIST AND DETAILS .....	7
TEST EQUIPMENT LIST .....	8
ENVIRONMENTAL CONDITIONS.....	9
<b>Summary of Test Results .....</b>	<b>10</b>
<b>1 – Conducted emissions .....</b>	<b>11</b>
MEASUREMENT UNCERTAINTY .....	11
TEST SYSTEM SETUP.....	11
EMI TEST RECEIVER SETUP .....	12
CORRECTED AMPLITUDE & MARGIN CALCULATION .....	12
TEST PROCEDURE .....	12
TEST DATA .....	13
<b>2 – Radiated emissions .....</b>	<b>19</b>
MEASUREMENT UNCERTAINTY .....	19
TEST SYSTEM SETUP.....	19
EMI TEST RECEIVER SETUP .....	20
TEST PROCEDURE .....	20
CORRECTED AMPLITUDE & MARGIN CALCULATION .....	20
TEST DATA .....	21
<b>3 – Electrostatic discharges IEC 61000-4-2.....</b>	<b>29</b>
MEASUREMENT UNCERTAINTY .....	29
TEST SYSTEM SETUP.....	29
TEST STANDARD.....	29
TEST PROCEDURE .....	30
TEST DATA .....	31
<b>4 – Continuous radiated disturbances IEC 61000-4-3.....</b>	<b>33</b>
MEASUREMENT UNCERTAINTY .....	33
TEST SYSTEM SETUP.....	33
TEST STANDARD.....	34
TEST LEVEL .....	34
TEST PROCEDURE .....	34
TEST DATA .....	35
<b>5 – Continuous conducted disturbances IEC 61000-4-6 .....</b>	<b>36</b>
MEASUREMENT UNCERTAINTY .....	36
TEST SETUP .....	36
TEST STANDARD.....	36
TEST PROCEDURE .....	37
TEST DATA .....	38
<b>7 – Electrical fast transients/burst IEC 61000-4-4.....</b>	<b>39</b>

MEASUREMENT UNCERTAINTY .....	39
TEST SYSTEM SETUP.....	39
TEST STANDARD.....	39
TEST PROCEDURE .....	40
TEST DATA .....	41
<b>8 – Surges IEC 61000-4-5.....</b>	<b>42</b>
TEST SYSTEM SETUP.....	42
TEST STANDARD.....	42
TEST PROCEDURE .....	42
TEST DATA .....	43
<b>9 – Voltage dips and short interruptions IEC 61000-4-11 .....</b>	<b>44</b>
TEST SETUP .....	44
TEST STANDARD.....	44
TEST PROCEDURE .....	44
TEST DATA .....	45
<b>11 – Voltage fluctuations and flicker .....</b>	<b>46</b>
TEST SYSTEM SETUP.....	46
TEST STANDARD.....	46
TEST DATA .....	47
<b>ExhibitA – Eut Photographs .....</b>	<b>48</b>
<b>ExhibitB – Test Setup Photographs.....</b>	<b>56</b>
CONDUCTED EMISSIONS .....	56
RADIATED EMISSION .....	58
ESD.....	60
RS .....	61
EFT .....	62
SURGE .....	63
DIPS .....	64
CS .....	65
FLICKER.....	66

## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

<b>EUT Name:</b>		PoE HD Network Video Recorder
<b>EUT Model:</b>		N6P-4H
<b>Rated Input Voltage:</b>		AC 100~240V,50/60Hz
<b>Adapter Information</b>	<b>Model:</b>	BN031-A65051
	<b>Input:</b>	AC 100~240V 50/60Hz, 1.5A
	<b>Output:</b>	DC 51V/1.25A
<b>The Highest Operating Frequency:</b>		1 GHz
<b>I/O Ports:</b>		Refer to manual
<b>EUT Function:</b>		Recording
<b>Serial Number:</b>		DG2210719-29899E-EM-S1
<b>EUT Received Date:</b>		2021.07.20
<b>EUT Received Status:</b>		Good

### Objective

This report is prepared on behalf of *SHENZHEN TENDA TECHNOLOGY CO.,LTD* in accordance with EN 55032:2015+A11:2020 and BS EN 55032:2015+A11:2020 Electromagnetic compatibility of multimedia equipment — Emission Requirements; EN 55035:2017+A11:2020 and BS EN 55035:2017+A11:2020 Electromagnetic compatibility of multimedia equipment — Immunity Requirements; EN IEC 61000-3-2:2019/A1:2021 and BS EN IEC 61000-3-2:2019/A1:2021 Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current  $\leq 16$  A per phase); EN 61000-3-3:2013+A1:2019 and BS EN 61000-3-3:2013+A1:2019 Electromagnetic compatibility (EMC) Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current  $\leq 16$  A per phase and not subject to conditional connection.

The objective is to determine the compliance of EUT with:

EN 55032:2015+A11:2020

EN 55035:2017+A11:2020

EN IEC 61000-3-2:2019/A1:2021

EN 61000-3-3:2013+A1:2019.

BS EN 55032:2015+A11:2020

BS EN 55035:2017+A11:2020

BS EN IEC 61000-3-2:2019/A1:2021

BS EN 61000-3-3:2013+A1:2019.

### Test Methodology

All measurements contained in this report were conducted with EN 55032:2015+A11:2020 and BS EN 55032:2015+A11:2020 Electromagnetic compatibility of multimedia equipment — Emission Requirements; EN 55035:2017+A11:2020 and BS EN 55035:2017+A11:2020 Electromagnetic compatibility of multimedia equipment — Immunity Requirements; EN IEC 61000-3-2:2019/A1:2021 and BS EN IEC 61000-3-2:2019/A1:2021 Electromagnetic compatibility (EMC) – Part 3-2: Limits – Limits for harmonic current emissions (equipment input current  $\leq 16$  A per phase); EN 61000-3-3:2013+A1:2019 and BS EN 61000-3-3:2013+A1:2019 Electromagnetic compatibility (EMC) Part 3-3: Limits – Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current  $\leq 16$  A per phase and not subject to conditional connection.

## Declarations

BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with a triangle symbol“▲”. Customer model name, addresses, names, trademarks etc. are not considered data.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

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## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user).

Normal Work

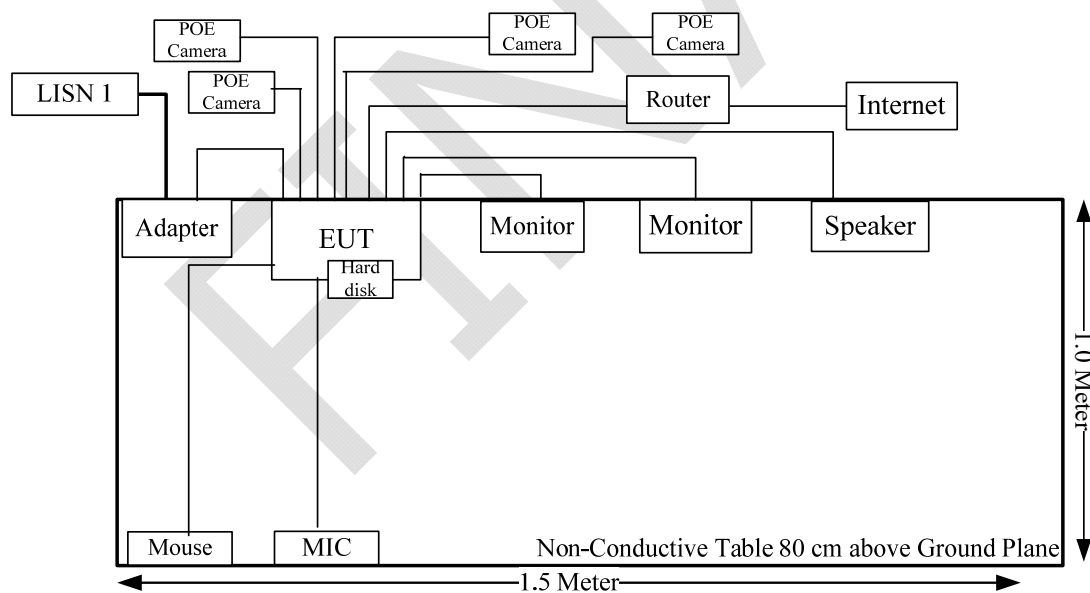
### Equipment Modifications

No modification was made to the EUT.

### EUT Exercise Software

N/A

### Block Diagram of Test Setup



**Support Equipment List and Details**

Manufacturer	Description	Model	Serial Number
Barracuda	Hard Disk	ST500DM002	23TVG4RZ
Hikvision	POE Carema	unknown	unknown
Milesight	POE Carema	unknown	unknown
Milesight	POE Carema	unknown	unknown
Milesight	POE Carema	unknown	unknown
ZIONCOM	WiFi Router	MB-R210-00	N/A
DELL	Monitor	U3011t	CN-OPH5NY-74445-17M-114L
DELL	Monitor	P2721Q	CN-0XJ46C-FCC00-135-A97L-A03
unknown	Mic	unknown	unknown
unknown	Speaker	unknown	unknown

**Support Cable List and Details**

Cable Description	Shielding Cable	Ferrite Core	Length (m)	From Port	To
RJ45	Yes	Yes	8	EUT	POE Carema
RJ45	Yes	Yes	8	EUT	POE Carema
RJ45	Yes	Yes	8	EUT	POE Carema
RJ45	Yes	Yes	8	EUT	POE Carema
RJ45	Yes	No	8	EUT	Rounter
VGA	Yes	No	0.8	EUT	Monitor
HDMI	Yes	No	0.8	EUT	Monitor
Aux	No	No	1	EUT	Mic
Aux	No	Yes	1	EUT	Speaker

**Test Equipment List**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted emission					
R&S	LISN	ENV 216	101614	2020-09-12	2021-09-12
TESEQ	ISN	T800	34379	2020-09-12	2021-09-12
R&S	EMI Test Receiver	ESCI	101121	2021-07-06	2022-07-05
MICRO-COAX	Coaxial Cable	C-NJNJ-50	C-0200-01	2020-09-05	2021-09-05
R&S	Test Software	EMC32	Version 9.10.00	N/A	N/A
Radiated emissions below 1GHz					
Sunol Sciences	Antenna	JB3	A060611-1	2020-11-10	2023-11-10
R&S	EMI Test Receiver	ESR3	102453	2020-09-12	2021-09-12
Unknown	Coaxial Cable	C-NJNJ-50	C-0075-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-0400-01	2020-09-05	2021-09-05
Unknown	Coaxial Cable	C-NJNJ-50	C-1400-01	2021-05-06	2022-05-05
Sonoma	Amplifier	310N	372193	2021-07-18	2022-07-17
Audix	Test Software	E3	201021 (V9)	N/A	N/A
Radiated emissions above 1GHz					
ETS-Lindgren	Horn Antenna	3115	000 527 35	2018-10-12	2021-10-12
Agilent	Spectrum Analyzer	E4440A	SG43360054	2021-07-22	2022-07-21
Unknown	Coaxial Cable	C-SJSJ-50	C-0800-01	2020-09-05	2021-09-05
Mini-Circuit	Amplifier	ZVA-213-S+	54201245	2020-09-05	2021-09-05
Farad	Test Software	EZ-EMC	V1.1.4.2	N/A	N/A
ESD					
HAEFELY	Electrostatic Discharge Simulator	ONYX	180786	2020-09-16	2021-09-16
EFT & Surge & Dips					
EM TEST	Ultra Compact Generator	UCS 500N5	P1406130994	2021-07-22	2022-07-21
EM TEST	Autotransformer	MV2616	P1450144859	N/A	N/A
EM TEST	CDN	CNV508 S1	311137	2021-01-26	2022-01-25
EM TEST	EFT Clamp	N/A	300886	2021-07-22	2022-07-21
Flicker & Harmonic					
ELGAR	AC Power Source	1751SX	5611	2020-09-23	2021-09-23
EM TEST	Harmonic & Flicker Analyzer	DPA 500	303278	2020-09-17	2021-09-16
CS					
HP	Signal Generator	8648A	3246A00831	2020-09-12	2021-09-12
R&S	Power Amplifier	15A250	12934	N/A	N/A
Werlatone	Dual Directional Coupler	C5091-10	113192	2021-02-09	2022-02-08
HP	Power Meter	HP EPM-441A	GB37481494	2020-09-12	2021-09-12
Agilent	8482A Power sensor	8482A	US37296108	2020-09-12	2021-09-12
NARDA	Attenuator	769-6	2754	N/A	N/A
COM-POWER	CDN	M325E	521064	2020-09-12	2021-09-12



Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
COM-POWER	CDN	T8E	581607	2019-05-09	2022-05-09
R&S	Audio Analyzer	UPV	103447	2021-04-28	2022-04-27
BK Precision	Sound Level meter	735	7350087310010020	2021-05-24	2022-05-23
RS					
AR	Antenna	ATL80M1G	0351400	N/A	N/A
AR	Antenna	ATT700M12G	0349410	N/A	N/A
HP	Signal Generator	8665B	3438a00584	2020-09-12	2021-09-12
AR	Power Amplifier	500W1000C	0353561	N/A	N/A
AR	Power Amplifier	60S1G6	0348711	N/A	N/A
PASTERNAK	Dual Directional Coupler	PE2239-30	1711	2021-07-15	2022-07-14
Agilent	EPM Series Power Meter	E4419B	MY45103907	2020-09-12	2021-09-12
Agilent	E-Series Avg Power Sensor	E9301A	MY41497625	2020-09-12	2021-09-12
Agilent	E-Series Avg Power Sensor	E9301A	MY41497628	2020-09-12	2021-09-12
R&S	Audio Analyzer	UPV	103447	2021-04-28	2022-04-27
BK Precision	Sound Level meter	735	7350087310010020	2021-05-24	2022-05-23

### Environmental Conditions

Test Item:	Conducted emission	Radiated emissions	Flicker & EMS
Temperature:	26.7°C	26.2~28.4°C	24.1~28.1°C
Relative Humidity:	67%	44~64%	50~57 %
ATM Pressure:	100.4kPa	99.9~100.kPa	100kPa
Tester:	Walker Chen	Redick zhang, Jeremy Liang	Ethan Xu
Test Date:	2021.08.12	2021.08.09~2021.08.10	2021.08.10

Note:

\*The relative humidity of ESD test environment is 50%.

## SUMMARY OF TEST RESULTS

SN	Rule and Clause	Description of Test	Test Result
1	EN 55032 Clause A.3	Conducted emissions	Compliance
2	EN 55032 Clause A.2	Radiated emissions	Compliance
3	EN 55035 Clause 4.2.1	Electrostatic discharges IEC 61000-4-2	Compliance
4	EN 55035 Clause 4.2.2.2	Continuous radiated disturbances IEC 61000-4-3	Compliance
5	EN 55035 Clause 4.2.2.3	Continuous conducted disturbances IEC 61000-4-6	Compliance
6	EN 55035 Clause 4.2.3	Power frequency magnetic fields IEC 61000-4-8	Not applicable*
7	EN 55035 Clause 4.2.4	Electrical fast transients/burst IEC 61000-4-4	Compliance
8	EN 55035 Clause 4.2.5	Surges IEC 61000-4-5	Compliance
9	EN 55035 Clause 4.2.6	Voltage dips and short interruptions IEC 61000-4-11	Compliance
10	EN 61000-3-2	Harmonic current emissions	Not applicable*
11	EN 61000-3-3	Voltage fluctuations and flicker	Compliance

Note:

Not applicable\*: The EUT is not sensitive to magnetic field.

Not applicable\*\*: The EUT Power is less than 75W.

## 1 – CONDUCTED EMISSIONS

### Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If  $U_{lab}$  is less than or equal to  $U_{cispr}$  of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If  $U_{lab}$  is greater than  $U_{cispr}$  of Table 1, then:

- compliance is deemed to occur if no measured disturbance level, increased by  $(U_{lab} - U_{cispr})$ , exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by  $(U_{lab} - U_{cispr})$ , exceeds the disturbance limit.

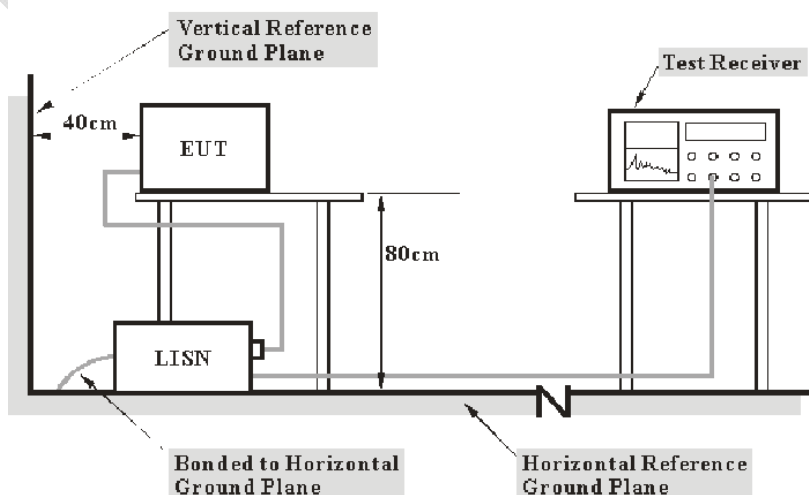
Based on CISPR 16-4-2-2011, measurement uncertainty of conducted disturbance at mains port using AMN at Bay Area Compliance Laboratories Corp. (Dongguan) is 3.12 dB (150 kHz to 30 MHz), and conducted disturbance at telecommunication port using AAN is 5.0 dB (150 kHz to 30 MHz).

Table 1 – Values of  $U_{cispr}$

Measurement	$U_{cispr}$
Conducted disturbance at mains port using AMN (9 kHz to 150 kHz)	3.8 dB
(150 kHz to 30 MHz)	3.4 dB
Conducted disturbance at mains port using voltage probe (9 kHz to 30 MHz)	2.9 dB
Conducted disturbance at telecommunication port using AAN (150 kHz to 30 MHz)	5.0 dB
Conducted disturbance at telecommunication port using CVP (150 kHz to 30 MHz)	3.9 dB
Conducted disturbance at telecommunication port using CP (150 kHz to 30 MHz)	2.9 dB

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

### Test System Setup



- Note: 1. Support units were connected to second LISN.  
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with CISPR 16-1-1:2010+A1:2010, CISPR 16-2-1:2008+A1:2010 measurement procedure. The specification used was the EN 55032 and BS EN 55032 Class A limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle.

The spacing between the peripherals was 10cm.

The adapter was connected to a 230V/50Hz AC line power source.

### EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

### Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result (QuasiPeak or Average) = Meter Reading + Corr.

Note:

Corr. = Cable loss + Factor of coupling device

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of 7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Limit – Result

### Test Procedure

During the conducted emissions test, the adapter of laptop was connected to the main outlet of the first LISN and the other support equipments were connected to the outlet of the second LISN.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

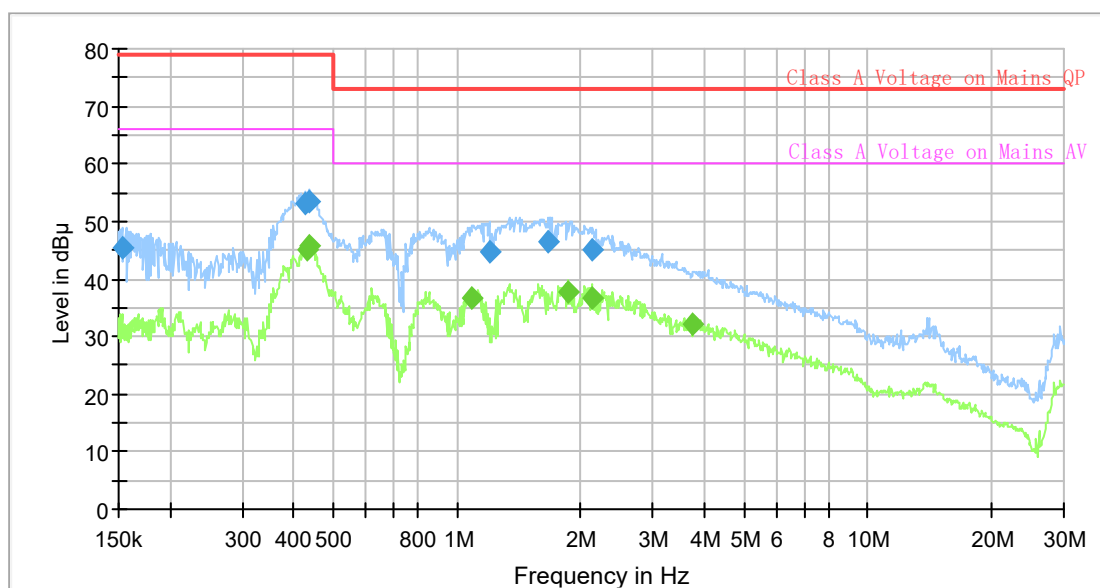
All data was recorded in the Quasi-peak and average detection mode.

Except for the recorded frequency points (no more than 6), the remaining frequency points have a margin more than 20dB.

## Test Data

Please refer to following table and plots:

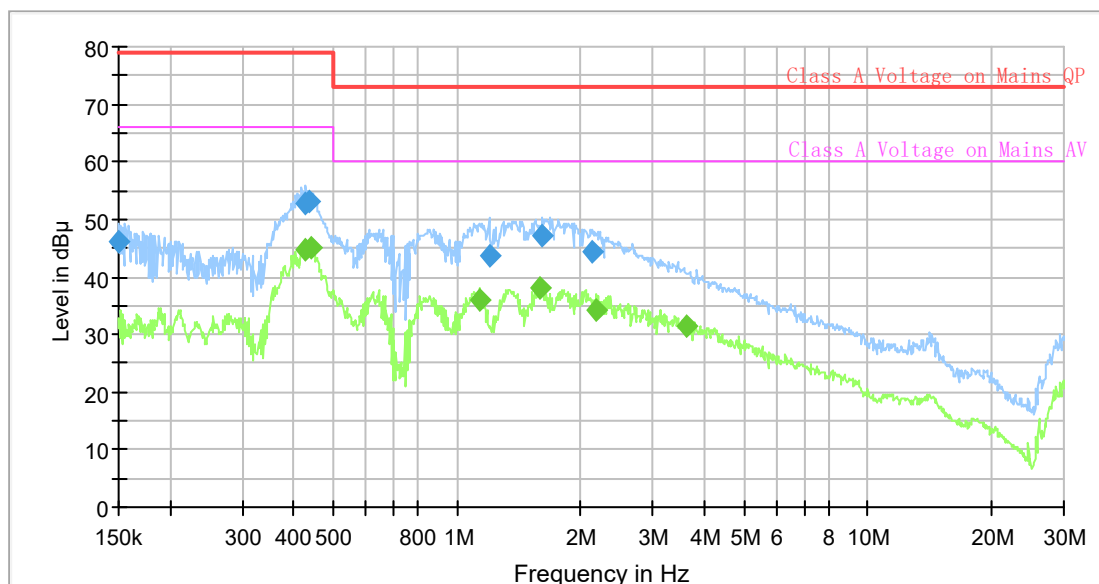
Model Number: N6P-4H  
 Port: L  
 Test Mode: Normal working  
 Power Source: AC 110V/50Hz  
 Note:



## Final Result

Frequency (MHz)	QuasiPeak (dB μ V)	Average (dB μ V)	Limit (dB μ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.153023	45.29	---	79.00	33.71	9.000	L1	9.6
0.427528	53.27	---	79.00	25.73	9.000	L1	9.6
0.429665	---	45.08	66.00	20.92	9.000	L1	9.6
0.438323	---	45.67	66.00	20.33	9.000	L1	9.6
0.438323	53.61	---	79.00	25.39	9.000	L1	9.6
1.086470	---	36.73	60.00	23.27	9.000	L1	9.7
1.200436	44.67	---	73.00	28.33	9.000	L1	9.7
1.668396	46.59	---	73.00	26.41	9.000	L1	9.7
1.861883	---	37.66	60.00	22.34	9.000	L1	9.7
2.130277	---	36.59	60.00	23.41	9.000	L1	9.7
2.140929	45.08	---	73.00	27.92	9.000	L1	9.7
3.761553	---	32.06	60.00	27.94	9.000	L1	9.7

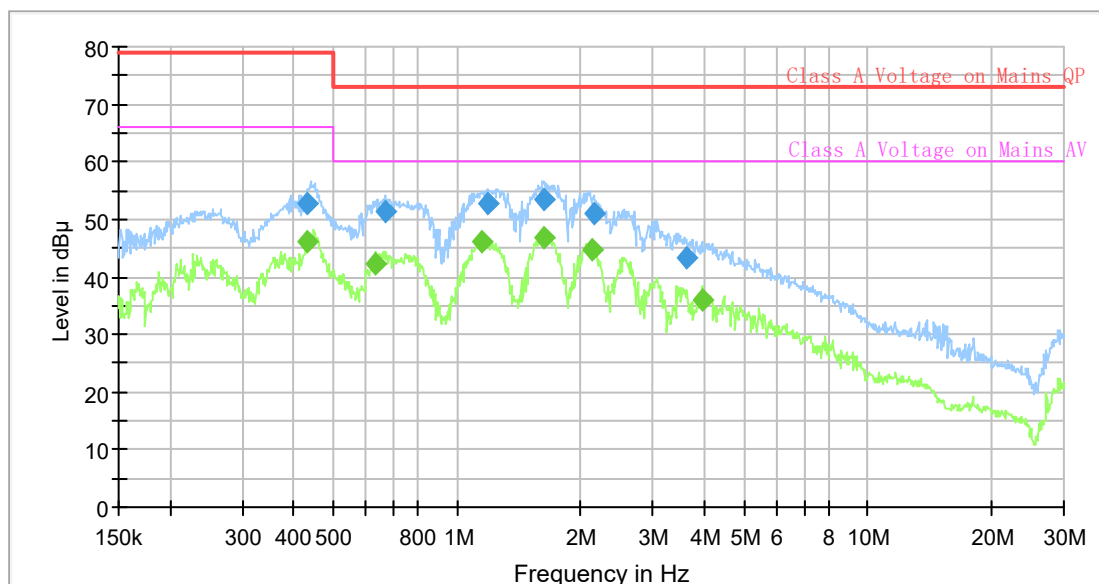
Model Number: N6P-4H  
Port: N  
Test Mode: Normal working  
Power Source: AC 110V/50Hz  
Note:



## Final Result

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Average (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	46.09	---	79.00	32.91	9.000	N	9.6
0.427528	---	44.55	66.00	21.45	9.000	N	9.6
0.427528	52.67	---	79.00	26.33	9.000	N	9.6
0.438323	53.12	---	79.00	25.88	9.000	N	9.6
0.442717	---	45.03	66.00	20.97	9.000	N	9.6
1.142032	---	35.84	60.00	24.16	9.000	N	9.6
1.200436	43.59	---	73.00	29.41	9.000	N	9.6
1.595161	---	38.19	60.00	21.81	9.000	N	9.6
1.611153	47.10	---	73.00	25.90	9.000	N	9.6
2.140929	44.39	---	73.00	28.61	9.000	N	9.6
2.184069	---	34.13	60.00	25.87	9.000	N	9.6
3.614420	---	31.61	60.00	28.39	9.000	N	9.6

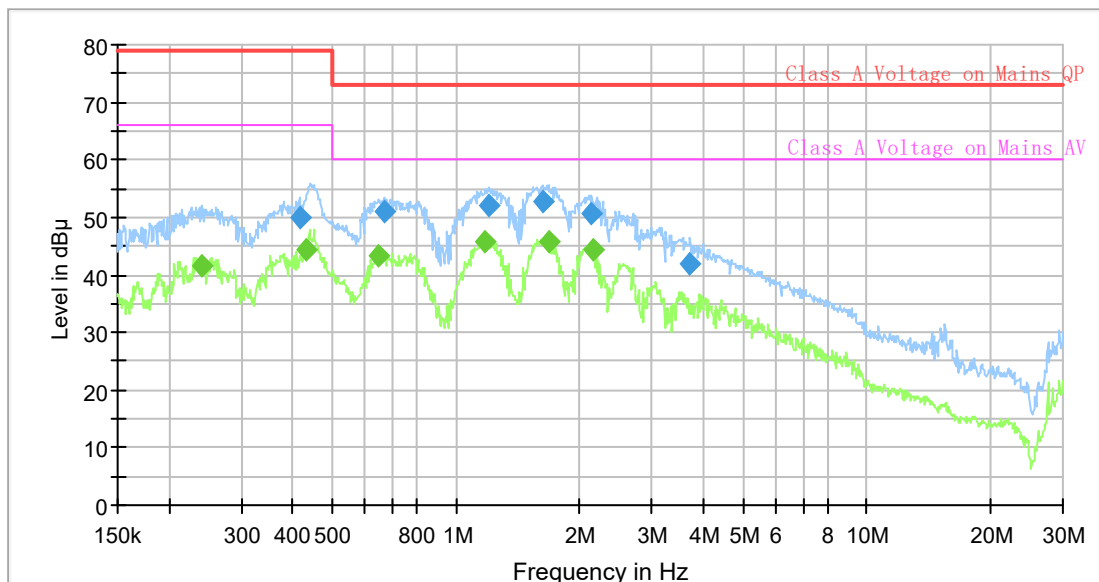
Model Number: N6P-4H  
 Port: L  
 Test Mode: Normal working  
 Power Source: AC 230V/50Hz  
 Note:



## Final Result

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Average (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.431814	---	45.98	66.00	20.02	9.000	L1	9.6
0.431814	52.62	---	79.00	26.38	9.000	L1	9.6
0.633991	---	42.30	60.00	17.70	9.000	L1	9.6
0.666413	51.42	---	73.00	21.58	9.000	L1	9.6
1.153481	---	45.94	60.00	14.06	9.000	L1	9.7
1.194464	52.92	---	73.00	20.08	9.000	L1	9.7
1.635441	53.60	---	73.00	19.40	9.000	L1	9.7
1.635441	---	46.76	60.00	13.24	9.000	L1	9.7
2.140929	---	44.74	60.00	15.26	9.000	L1	9.7
2.151633	51.13	---	73.00	21.87	9.000	L1	9.7
3.614420	43.34	---	73.00	29.66	9.000	L1	9.7
3.953919	---	35.93	60.00	24.07	9.000	L1	9.7

Model Number: N6P-4H  
Port: N  
Test Mode: Normal working  
Power Source: AC 230V/50Hz  
Note:

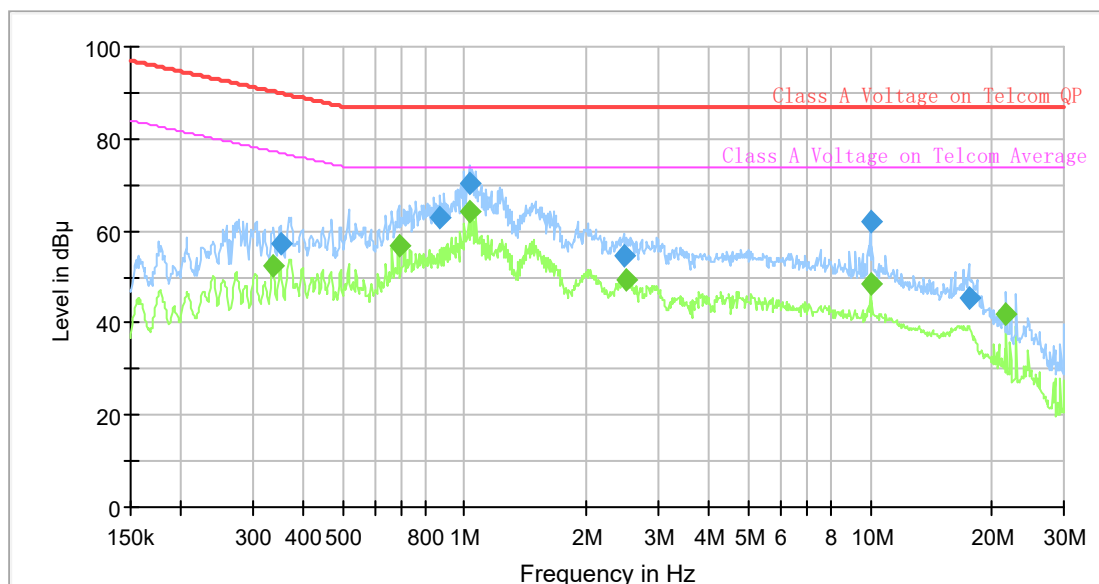


## Final Result

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Average (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.240917	---	41.46	66.00	24.54	9.000	N	9.6
0.416998	49.85	---	79.00	29.15	9.000	N	9.6
0.429665	---	44.39	66.00	21.61	9.000	N	9.6
0.646766	---	43.29	60.00	16.71	9.000	N	9.6
0.666413	50.91	---	73.00	22.09	9.000	N	9.6
1.176724	---	45.62	60.00	14.38	9.000	N	9.6
1.206438	52.19	---	73.00	20.81	9.000	N	9.6
1.627304	52.85	---	73.00	20.15	9.000	N	9.6
1.685121	---	45.92	60.00	14.08	9.000	N	9.6
2.140929	50.55	---	73.00	22.45	9.000	N	9.6
2.151633	---	44.23	60.00	15.77	9.000	N	9.6
3.705689	42.04	---	73.00	30.96	9.000	N	9.6



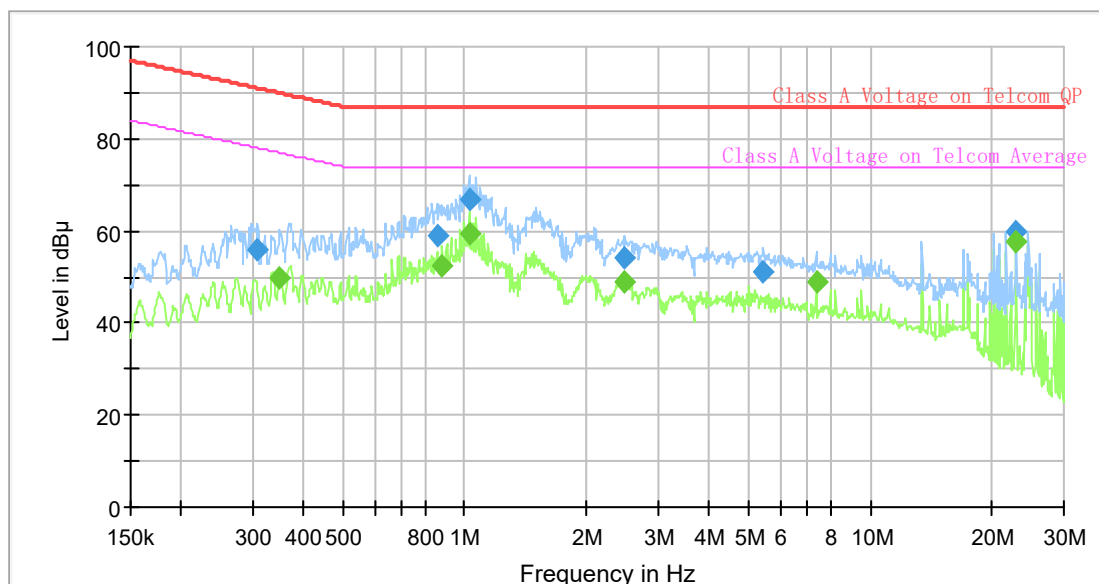
Model Number: N6P-4H  
 Port: LAN  
 Test Mode: 10Mbps  
 Power Source: AC 230V/50Hz  
 Note:



## Final Result

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Average (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.336506	---	52.32	77.29	24.97	9.000	Line 1	9.9
0.351956	57.20	---	89.92	32.72	9.000	Line 1	9.9
0.686657	---	56.66	74.00	17.34	9.000	Line 1	9.7
0.868051	62.80	---	87.00	24.20	9.000	Line 1	9.7
1.023352	---	64.03	74.00	9.97	9.000	Line 1	9.7
1.023352	70.31	---	87.00	16.69	9.000	Line 1	9.7
2.461795	54.69	---	87.00	32.31	9.000	Line 1	9.6
2.511402	---	49.39	74.00	24.61	9.000	Line 1	9.6
9.998049	62.20	---	87.00	24.80	9.000	Line 1	9.6
9.998049	---	48.56	74.00	25.44	9.000	Line 1	9.6
17.478903	45.20	---	87.00	41.80	9.000	Line 1	9.6
21.659819	---	41.82	74.00	32.18	9.000	Line 1	9.7

Model Number: N6P-4H  
 Port: LAN  
 Test Mode: 100Mbps  
 Power Source: AC 230V/50Hz  
 Note:



## Final Result

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Average (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Bandwidth (kHz)	Line	Corr. (dB)
0.309151	55.75	---	90.99	35.24	9.000	Line 1	9.9
0.350205	---	49.63	76.96	27.33	9.000	Line 1	9.9
0.855159	58.80	---	87.00	28.20	9.000	Line 1	9.7
0.876753	---	52.51	74.00	21.49	9.000	Line 1	9.7
1.023352	66.61	---	87.00	20.39	9.000	Line 1	9.7
1.023352	---	59.49	74.00	14.51	9.000	Line 1	9.7
2.461795	---	48.97	74.00	25.03	9.000	Line 1	9.6
2.486475	53.99	---	87.00	33.01	9.000	Line 1	9.6
5.440712	50.94	---	87.00	36.06	9.000	Line 1	9.6
7.375399	---	48.71	74.00	25.29	9.000	Line 1	9.6
22.881343	---	57.46	74.00	16.54	9.000	Line 1	9.7
22.881343	59.99	---	87.00	27.01	9.000	Line 1	9.7

## 2 - RADIATED EMISSIONS

### Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If  $U_{lab}$  is less than or equal to  $U_{cispr}$  of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If  $U_{lab}$  is greater than  $U_{cispr}$  of Table 1, then:

- compliance is deemed to occur if no measured disturbance level, increased by  $(U_{lab} - U_{cispr})$ , exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by  $(U_{lab} - U_{cispr})$ , exceeds the disturbance limit.

Based on CISPR 16-4-2: 2011, measurement uncertainty of radiated emission at a distance of 10m at Bay Area Compliance Laboratories Corp. (Dongguan) is: 30M~200MHz: 4.55 dB for Horizontal, 4.57 dB for Vertical; 200M~1GHz: 4.66 dB for Horizontal, 4.56 dB for Vertical; measurement uncertainty of radiated emission at a distance of 3m at Bay Area Compliance Laboratories Corp. (Dongguan) is: 30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical; 200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical; 1G~6GHz: 4.45 dB, 6G~18GHz: 5.23 dB.

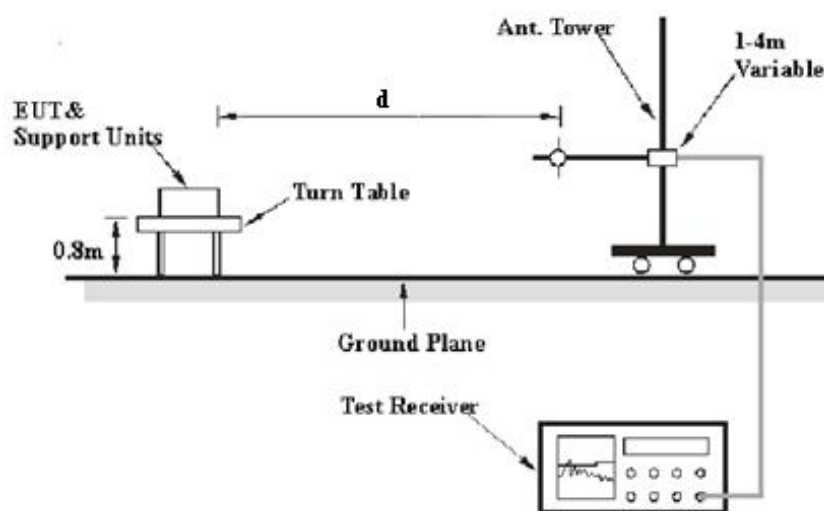
Table 1 – Values of  $U_{cispr}$

Measurement	$U_{cispr}$
Radiated disturbance (electric field strength at an OATS or in a SAC) (30 MHz to 1000 MHz)	6.3 dB
Radiated disturbance (electric field strength in a FAR) (1 GHz to 6 GHz)	5.2 dB
Radiated disturbance (electric field strength in a FAR) (6 GHz to 18 GHz)	5.5 dB

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

### Test System Setup

Below 1GHz:



The radiated emission tests below 1GHz were performed in 3 meters, using the setup accordance with the CISPR 16-1-1:2010+A1:2010, CISPR 16-1-4:2010, CISPR 16-2-3:2010. The specification used was EN 55032 and BS EN 55032 Class A limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40cm long in the middle.

The spacing between the peripherals was 10cm.

### EMI Test Receiver Setup

The system was investigated from 30 MHz to 6 GHz.

During the radiated emission test, the EMI test receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	120 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1 MHz	3 MHz	/	Peak
	1 MHz	Reduced video bandwidth	/	AVG

### Test Procedure

During the radiated emissions, maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

If the maximized peak measured value complies with under the QP limit more than 6dB, then it is unnecessary to perform QP measurement.

### Corrected Amplitude & Margin Calculation

The basic equation is as follows:

Result = Meter Reading + Corrected

Note:

Corrected = Antenna Factor + Cable Loss - Amplifier Gain

or

Corrected = Antenna Factor + Cable Loss + Insertion loss of attenuator - Amplifier Gain

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit for Class A. The equation for margin calculation is as follows:

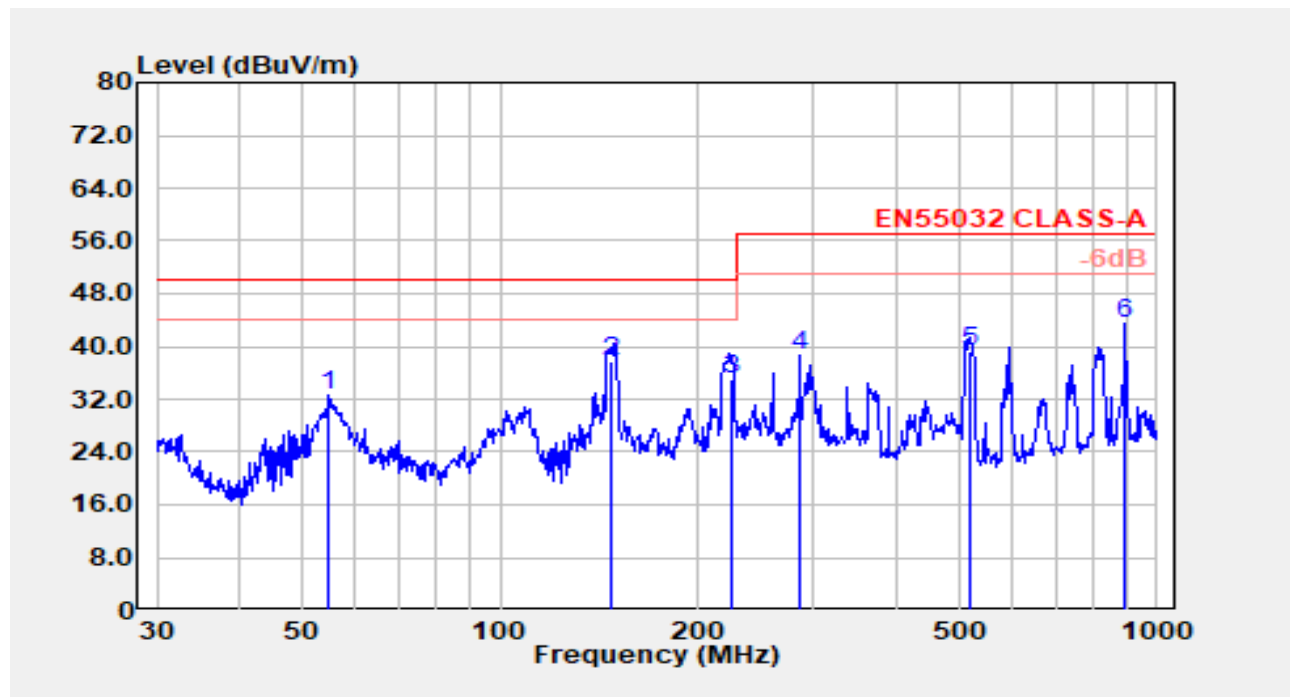
Margin = Limit – Result

## Test Data

Please refer to following table and plots:

**Condition:** EN 55032 Class A 3m Radiation  
**EUT:** PoE HD Network Video Recorder  
**Model:** N6P-4H  
**Test Mode:** Normal Working  
**Note:**

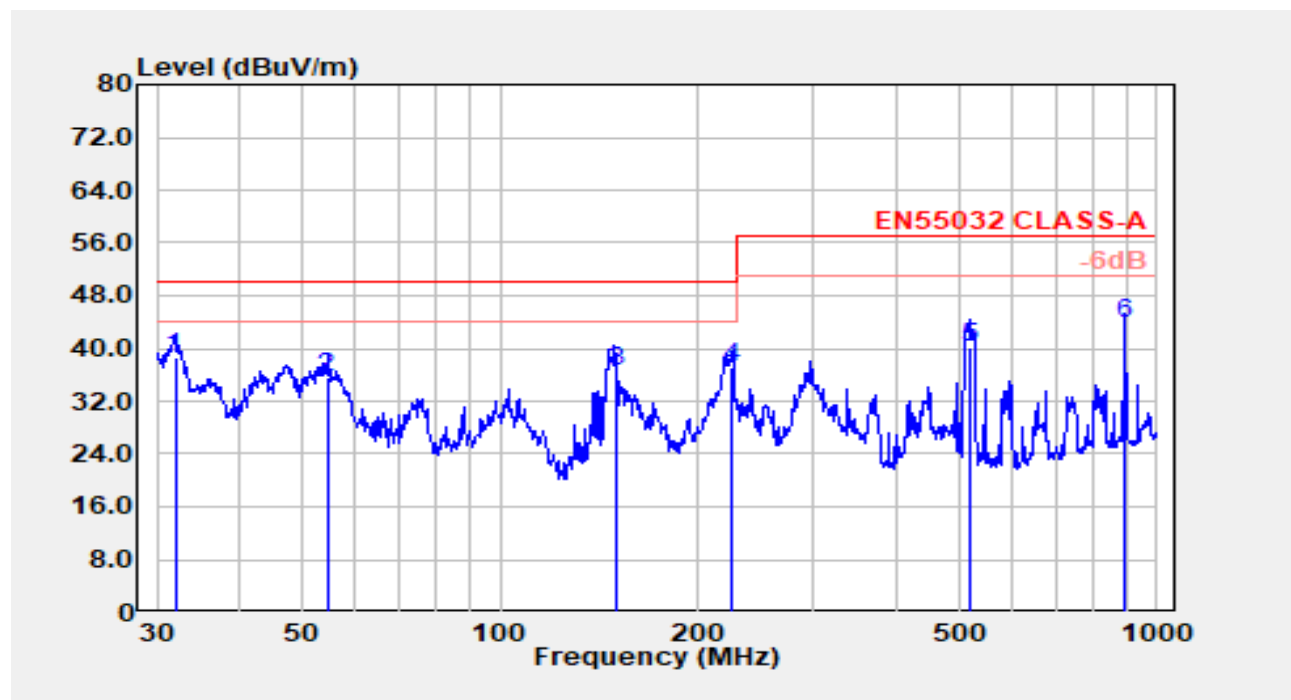
**Polarization:** Horizontal  
**Power:** 230V/50Hz  
**Distance:** 3m



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	54.643	51.28	-18.62	32.66	50.00	17.34	QP
2	147.425	50.88	-13.23	37.65	50.00	12.35	QP
3	224.950	49.05	-14.09	34.96	50.00	15.04	QP
4	285.978	51.29	-12.71	38.58	57.00	18.42	QP
5	519.065	47.10	-7.75	39.35	57.00	17.65	QP
6	893.857	46.07	-2.70	43.37	57.00	13.63	QP

Condition: EN 55032 Class A 3m Radiation  
EUT: PoE HD Network Video Recorder  
Model: N6P-4H  
Test Mode: Normal Working  
Note:

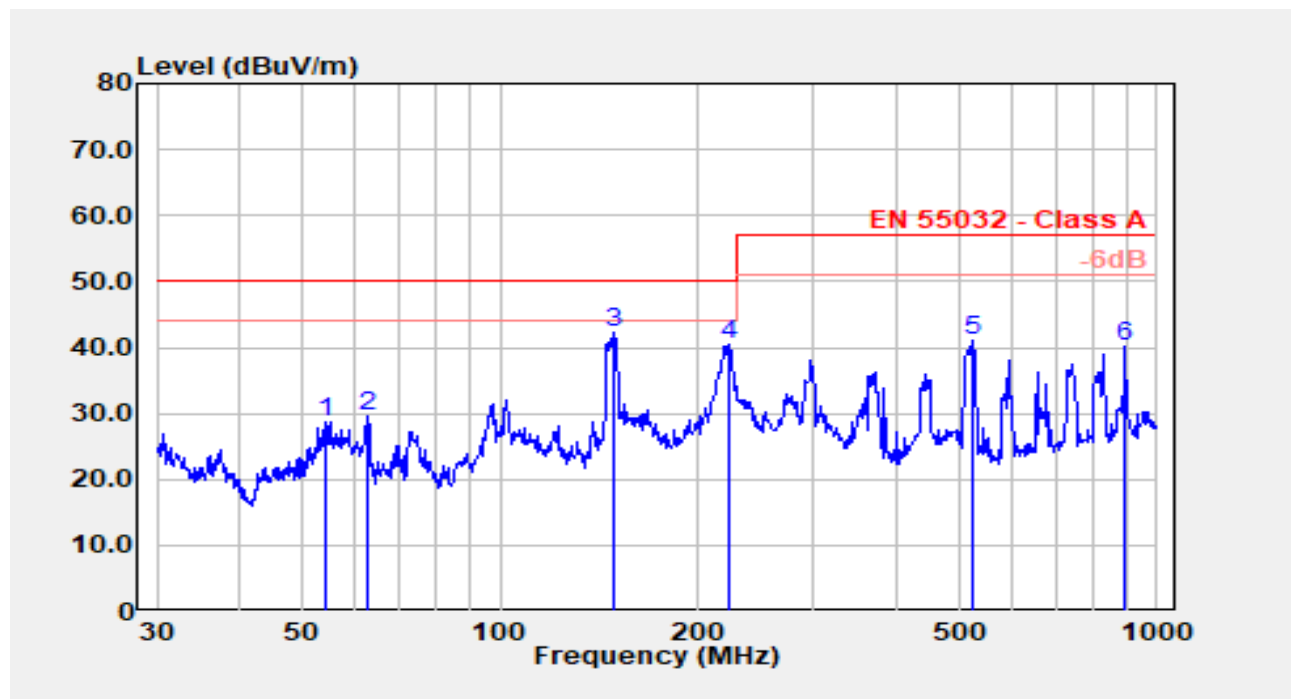
Polarization: Vertical  
Power: 230V/50Hz  
Distance: 3m



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	31.955	45.30	-6.71	38.59	50.00	11.41	QP
2	54.452	54.30	-18.61	35.69	50.00	14.31	QP
3	149.963	49.91	-13.26	36.65	50.00	13.35	QP
4	225.099	51.28	-14.09	37.19	50.00	12.81	QP
5	519.065	47.90	-7.75	40.15	57.00	16.85	QP
6	893.857	46.60	-2.70	43.90	57.00	13.10	QP

Condition: EN 55032 Class A 3m Radiation  
EUT: PoE HD Network Video Recorder  
Model: N6P-4H  
Test Mode: Normal Working  
Note:

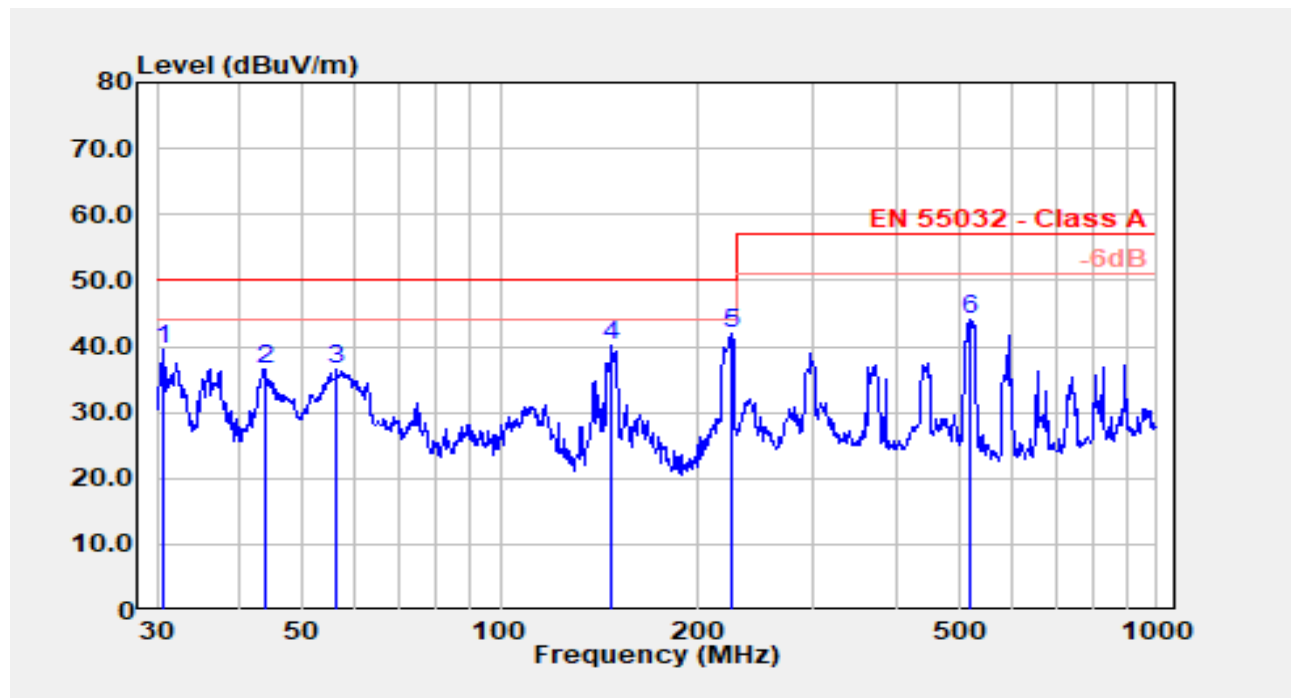
Polarization: Horizontal  
Power: AC 110V/50Hz  
Distance: 3m



No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	54.261	46.26	-17.49	28.77	50.00	21.23	QP
2	62.871	46.99	-17.36	29.63	50.00	20.37	QP
3	149.486	54.45	-12.26	42.19	50.00	7.81	QP
4	223.733	53.57	-13.02	40.55	50.00	9.45	QP
5	522.718	47.24	-6.10	41.14	57.00	15.86	QP
6	893.857	41.53	-1.35	40.18	57.00	16.82	QP

Condition: EN 55032 Class A 3m Radiation  
EUT: PoE HD Network Video Recorder  
Model: N6P-4H  
Test Mode: Normal Working  
Note:

Polarization: Vertical  
Power: AC 110V/50Hz  
Distance: 3m



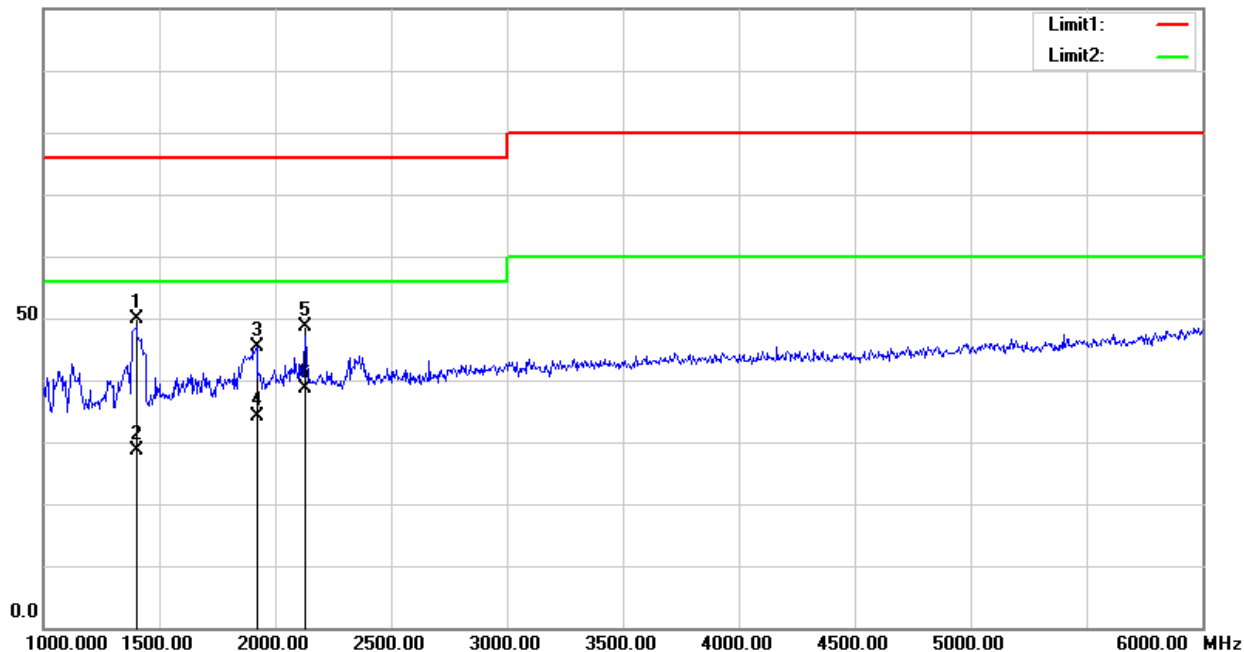
No.	Frequency (MHz)	Reading (dBμV)	Factor (dB/m)	Result (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Detector
1	30.638	43.79	-4.28	39.51	50.00	10.49	QP
2	43.812	50.41	-13.80	36.61	50.00	13.39	QP
3	56.395	54.15	-17.53	36.62	50.00	13.38	QP
4	147.404	52.36	-12.23	40.13	50.00	9.87	QP
5	225.308	54.95	-13.05	41.90	50.00	8.10	QP
6	519.065	50.04	-6.06	43.98	57.00	13.02	QP



**Condition:** EN 55032 Class A  
**EUT:** PoE HD Network Video Recorder  
**Model:** N6P-4H  
**Test Mode:** Mode 1: Normal working  
**Note:**

**Polarization:** Horizontal  
**Power:** AC 230V/50Hz  
**Distance:** 3m

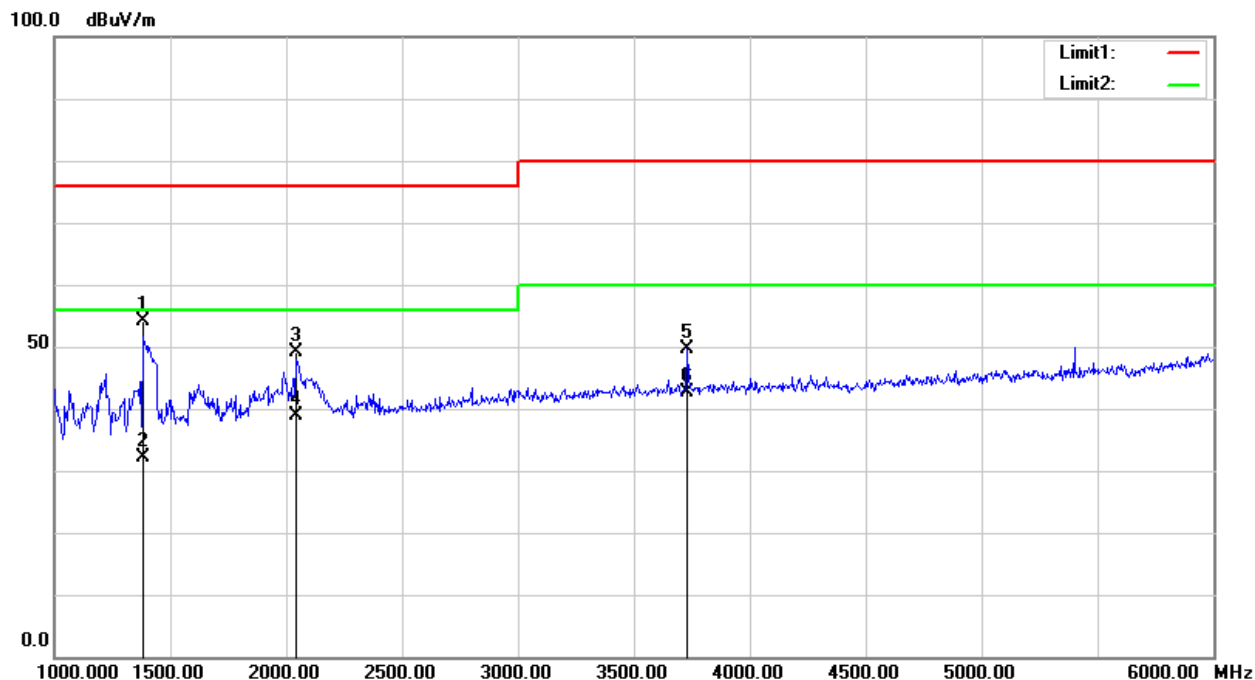
100.0 dBuV/m



No.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	1400.000	49.57	peak	0.28	49.85	76.00	26.15
2	1400.000	28.35	AVG	0.28	28.63	56.00	27.37
3	1920.000	42.75	peak	2.60	45.35	76.00	30.65
4	1920.000	31.58	AVG	2.60	34.18	56.00	21.82
5	2132.500	44.83	peak	3.83	48.66	76.00	27.34
6	2132.500	34.89	AVG	3.83	38.72	56.00	17.28

**Condition:** EN 55032 Class A  
**EUT:** PoE HD Network Video Recorder  
**Model:** N6P-4H  
**Test Mode:** Mode 1: Normal working  
**Note:**

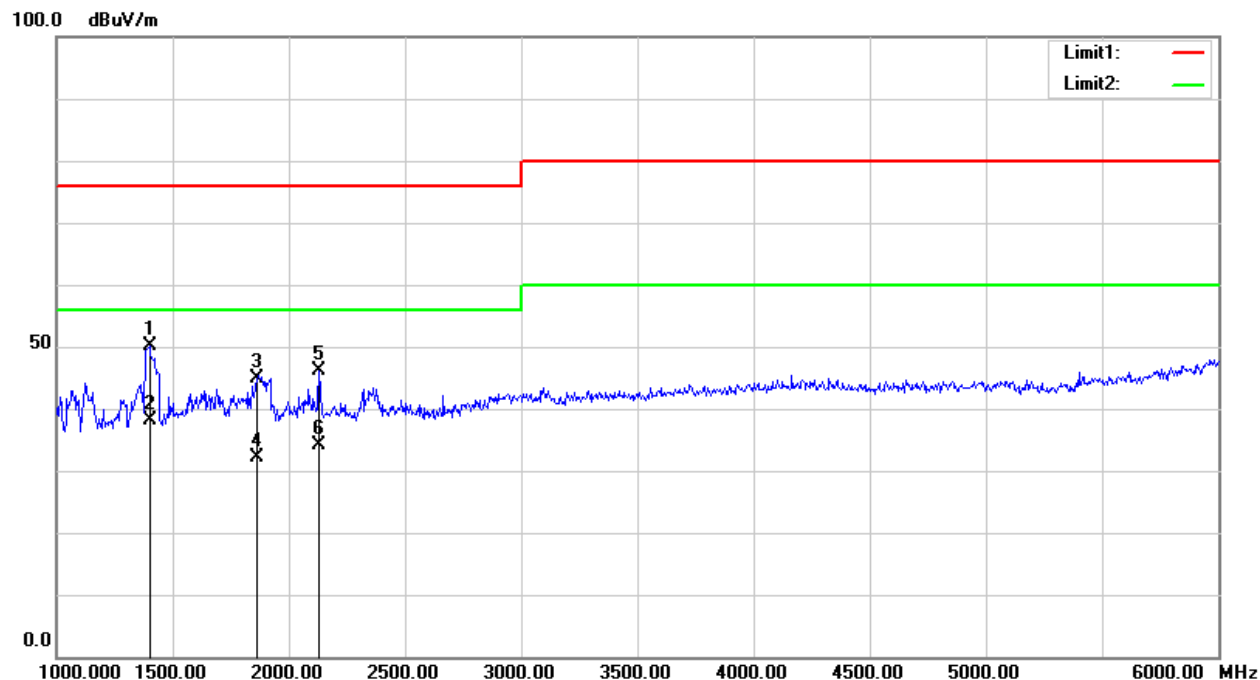
**Polarization:** Vertical  
**Power:** AC 230V/50Hz  
**Distance:** 3m



No.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	1382.500	53.84	peak	0.22	54.06	76.00	21.94
2	1382.500	31.95	AVG	0.22	32.17	56.00	23.83
3	2040.000	45.35	peak	3.74	49.09	76.00	26.91
4	2040.000	35.24	AVG	3.74	38.98	56.00	17.02
5	3732.500	41.24	peak	8.49	49.73	80.00	30.27
6	3732.500	34.17	AVG	8.49	42.66	60.00	17.34

**Condition:** EN 55032 Class A  
**EUT:** PoE HD Network Video Recorder  
**Model:** N6P-4H  
**Test Mode:** Mode 1: Normal working  
**Note:**

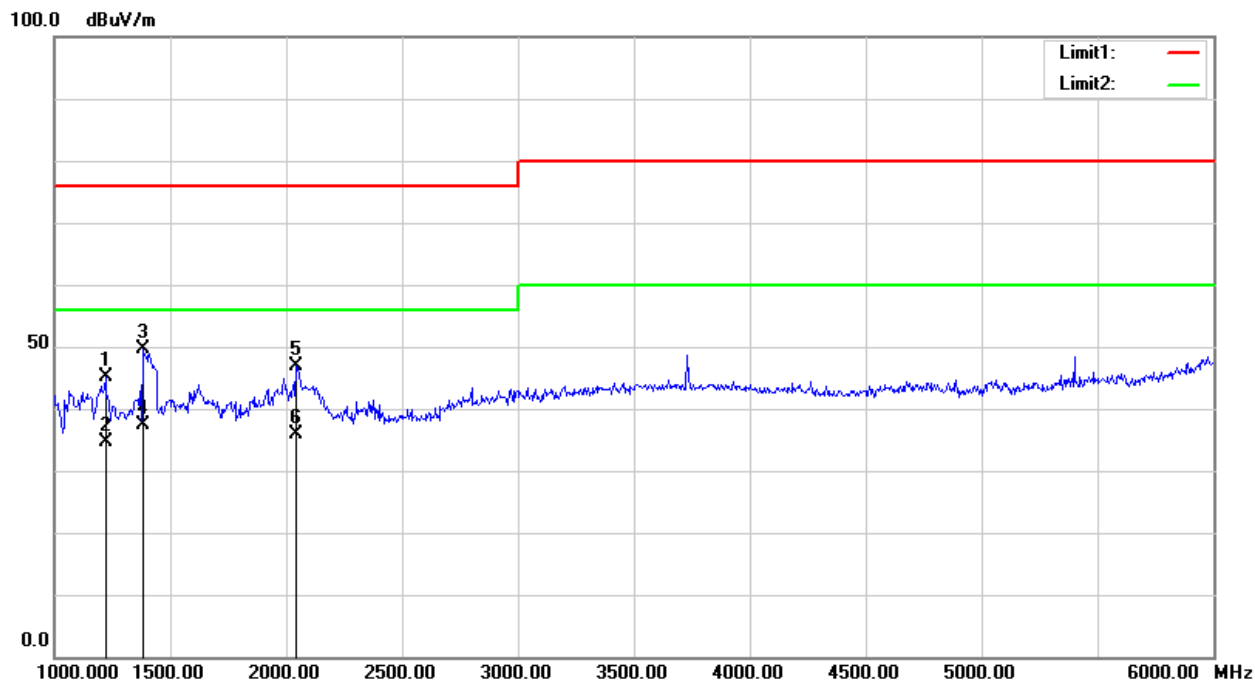
**Polarization:** Horizontal  
**Power:** AC 110V/50Hz  
**Distance:** 3m



No.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	1400.000	49.77	peak	0.28	50.05	76.00	25.95
2	1400.000	37.74	AVG	0.28	38.02	56.00	17.98
3	1860.000	42.52	peak	2.34	44.86	76.00	31.14
4	1860.000	29.71	AVG	2.34	32.05	56.00	23.95
5	2130.000	42.37	peak	3.82	46.19	76.00	29.81
6	2130.000	30.38	AVG	3.82	34.20	56.00	21.80

**Condition:** EN 55032 Class A  
**EUT:** PoE HD Network Video Recorder  
**Model:** N6P-4H  
**Test Mode:** Mode 1: Normal working  
**Note:**

**Polarization:** Vertical  
**Power:** AC 110V/50Hz  
**Distance:** 3m



No.	Frequency (MHz)	Reading (dBuV)	Detector	Corrected dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	1220.000	45.44	peak	-0.28	45.16	76.00	30.84
2	1220.000	35.02	AVG	-0.28	34.74	56.00	21.26
3	1380.000	49.49	peak	0.21	49.70	76.00	26.30
4	1380.000	37.20	AVG	0.21	37.41	56.00	18.59
5	2040.000	43.12	peak	3.74	46.86	76.00	29.14
6	2040.000	32.05	AVG	3.74	35.79	56.00	20.21

### 3 - ELECTROSTATIC DISCHARGES IEC 61000-4-2

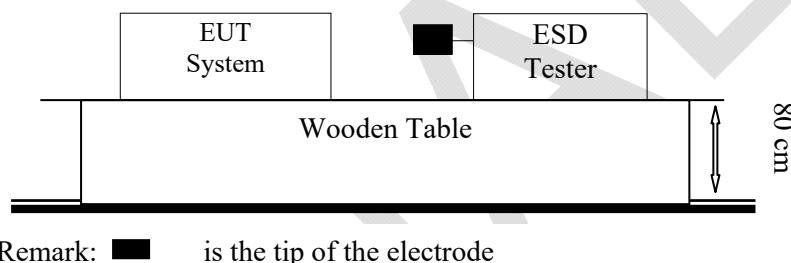
#### Measurement Uncertainty

$U_{lab}$ (measurement uncertainty of lab) and  $U_{EN}$ (measurement uncertainty of EN 61000-4-2 and BS EN 61000-4-2) please refer to the following:

Parameter	$U_{EN}$	$U_{lab}$
Rise time $t_r$	$\leq 15\%$	15%
Peak current $I_p$	$\leq 7\%$	6.30%
Current at 30 ns	$\leq 7\%$	6.30%
Current at 60 ns	$\leq 7\%$	6.30%

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

#### Test System Setup



IEC61000-4-2 specifies that a tabletop EUT shall be placed on a non-conducting table which is 80 centimeters above a ground reference plane and that floor mounted equipment shall be placed on a insulating support approximately 10 centimeters above a ground plane. During the tests, the EUT is positioned over a ground reference plane in conformance with this requirement.

For tabletop equipment, a 1.6 by 0.8-meter metal sheet (HCP) is placed on the table and connected to the ground plane via a metal strap with two 470 k Ohms resistors in series. The EUT and attached cables are isolated from this metal sheet by 0.5-millimeter thick insulating material. A Vertical Coupling Plane (VCP) grounded on the ground plane through the same configuration as in the HCP is used.

#### Test Standard

EN 55035:2017+A11:2020(IEC 61000-4-2:2008)  
 BS EN 55035:2017+A11:2020(IEC 61000-4-2:2008)  
 Test level 3 for Air Discharge at  $\pm 8$  kV  
 Test level 2 for Contact Discharge at  $\pm 4$  kV

**Test Level**

Level	Test Voltage Contact Discharge ( $\pm$ kV)	Test Voltage Air Discharge ( $\pm$ kV)
1.	2	2
2.	4	4
3.	6	8
4.	8	15
X.	Special	Special

**Performance criteria: B****Test Procedure****Air Discharge:**

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

**Contact Discharge:**

All the procedure shall be same as Section 8.3.1 of IEC 61000-4-2, except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

**Indirect discharge for horizontal coupling plane:**

At least 50 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

**Indirect discharge for vertical coupling plane:**

At least 50 single discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions  $0.5\text{m} \times 0.5\text{m}$ , is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

**Test Data***Please refer to following tables:***Test Mode:** Normal working**Note:****Table 1: Electrostatic Discharge Immunity (Air Discharge)**

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-8 kV	+8 kV	-15 kV	+15 kV
Non-metallic Shell	A	A	A	A	A	A	/	/
Button	A	A	A	A	A	A	/	/
Seam	A	A	A	A	A	A	/	/
DC Port	A	A	A	A	A	A		

**Table 2: Electrostatic Discharge Immunity (Direct Contact)**

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Metal shell	A	A	A	A	/	/	/	/
RJ45 Port	A	A	A	A	A	A	/	/
AUX Port	A	A	A	A	A	A	/	/
USB Port	A	A	A	A	A	A	/	/
RJ45 Port	A	A	A	A	A	A	/	/
HDMI Port	A	A	A	A	A	A	/	/
VGA Port	A	A	A	A	A	A	/	/

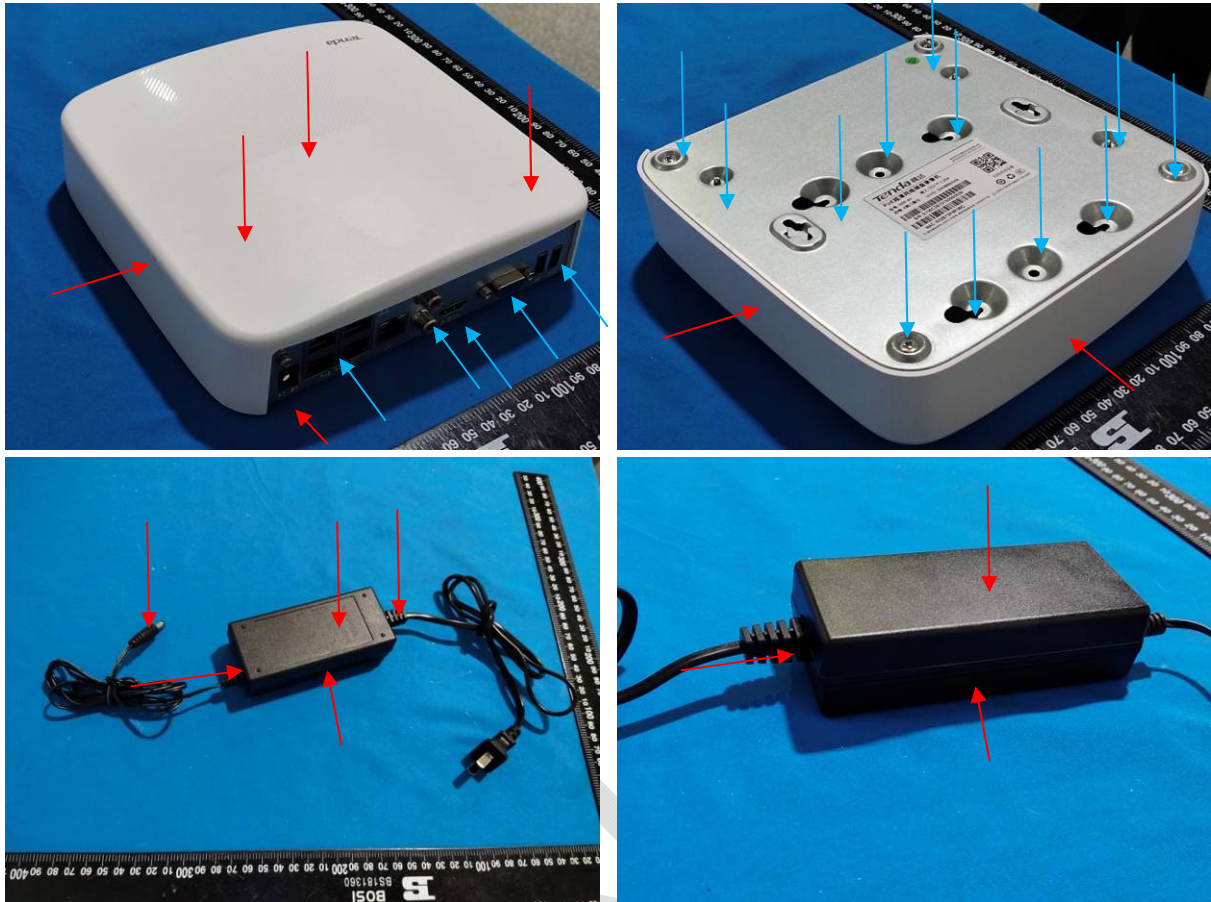
**Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)**

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	/	/	/	/
Back Side	A	A	A	A	/	/	/	/
Left Side	A	A	A	A	/	/	/	/
Right Side	A	A	A	A	/	/	/	/

**Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)**

Test Points Location	Test Level							
	-2 kV	+2 kV	-4 kV	+4 kV	-6 kV	+6 kV	-8 kV	+8 kV
Front Side	A	A	A	A	/	/	/	/
Back Side	A	A	A	A	/	/	/	/
Left Side	A	A	A	A	/	/	/	/
Right Side	A	A	A	A	/	/	/	/

ESD Location Photo



Air Discharge:

Direct Contact:



## 4 - CONTINUOUS RADIATED DISTURBANCES IEC 61000-4-3

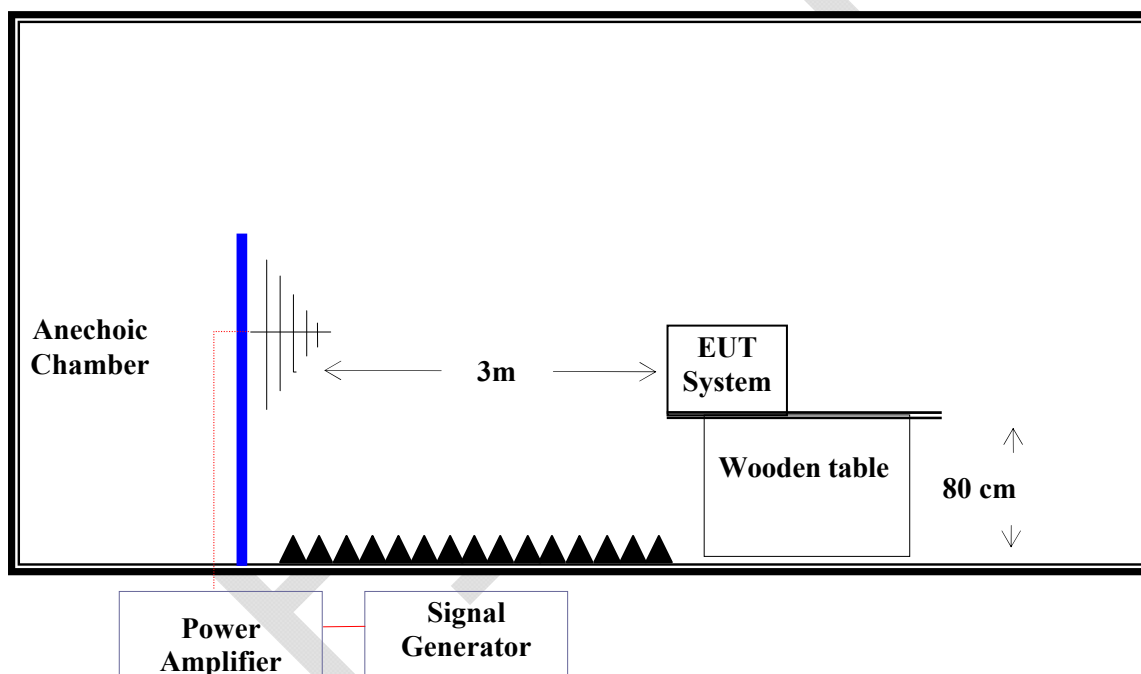
### Measurement Uncertainty

$U_{\text{lab}}$ (measurement uncertainty of lab) and  $U_{\text{EN}}$ (measurement uncertainty of EN 61000-4-3 and BS EN 61000-4-3) please refer to the following:

Parameter	$U_{\text{EN}}$	$U_{\text{lab}}$
Calibration process	1.88 dB	1.88 dB
Level setting	2.19 dB	2.19 dB

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

### Test System Setup



**Test Standard**

EN 55035:2017+A11:2020 (IEC 61000-4-3:2020)

BS EN 55035:2017+A11:2020 (IEC 61000-4-3:2020)

**Test Level**

Level	Field Strength V/m
1.	1
2.	3
3.	10
X.	Special

**Performance criteria: A****Test Procedure**

The EUT and its simulators are placed on a turn table which is 0.8 meter above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarizations of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD camera is used to monitor the EUT.

**Test Data**

Please refer to following tables:

**Test Mode:** Normal working

**Note:**

Condition of Test	Remarks
Field Strength	3 V/m (Test Level 2)
RF Signal	1 kHz, 80% AM, sine wave
Sweep Frequency Step	1%, logarithmic
Dwell Time	1 Sec

**Table 1:** Radiated RF-Electromagnetic Field Immunity

Frequency Range (MHz)	Front Side		Rear Side		Left Side		Right Side	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	A	A	A	A	A	A	A	A

**Table 2:** Radiated RF-Electromagnetic Field Immunity

Spot Test (MHz)	Front Side		Rear Side		Left Side		Right Side	
	VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
1800, 2600, 3500, 5000	A	A	A	A	A	A	A	A

## 5 - CONTINUOUS CONDUCTED DISTURBANCES IEC 61000-4-6

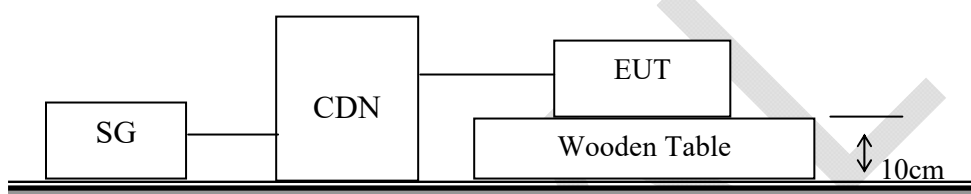
### Measurement Uncertainty

$U_{lab}$ (measurement uncertainty of lab) and  $U_{EN}$ (measurement uncertainty of EN 61000-4-6 and BS EN 61000-4-6) please refer to the following:

Parameter	$U_{EN}$	$U_{lab}$
CDN calibration process	1.27 dB	1.27 dB
CDN test process	1.36 dB	1.36 dB

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

### Test Setup



### Test Standard

EN 55035:2017+A11:2020 (IEC 61000-4-6:2013)  
 BS EN 55035:2017+A11:2020 (IEC 61000-4-6:2013)  
 Test level 2 at 3 V (r.m.s.), 0.15MHz ~ 10MHz,  
 Test level 3-1 V (r.m.s.), 10MHz ~ 30MHz,  
 Test level 1 at 1 V (r.m.s.), 30MHz ~ 80MHz,

### Test Level

Level	Voltage Level (r.m.s.) (V)
1	1
2	3
3	10
X	Special

Performance criteria: A

## Test Procedure

- 1) Let the EUT work in test mode and test it.
- 2) The EUT are placed on an insulating support 0.1m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 3) The disturbance signal described below is injected to EUT through CDN.
- 4) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 5) The frequency range is swept from 150 kHz to 80MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave.
- 6) Where the frequency is swept incrementally, the step size shall not exceed 1 % of the preceding frequency value. The dwell time of the amplitude modulated carrier at each frequency shall not be less than the time necessary for the EUT to be exercised and to respond, but shall in no case be less than 0.5 s.
- 7) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

**Test Data**

Please refer to following tables:

**Test Mode:** Normal working

**Note:**

**Table 1:** AC mains power input port

Frequency range: 150 kHz to 80 MHz  
☒ Modulated: Amplitude 80%, 1kHz sine wave ☐ Unmodulated  
 Dwell Time 1 Sec

Frequency(MHz)	Voltage Level	Pass	Fail
0.15-10	3V	A	/
10-30	3V-1V		
30-80	1V		

**Table 2:** Not Supporting Telephony Audio output function Acoustic measurements

Frequency (MHz)	Voltage Level	L0 (dBA)	L1 (dBA)	Acoustic interference ratio(dB)	Limit (dB)	Perform Criterion	Remark
0.15-10	3V	75	48	-27	≤-20	A	PASS
10-30	3V-1V						
30-80	1V						

**NOTE:**

Electrical measurement procedures

1. Record the resulting dB(SPL) level (or other appropriate unit) as the value of L0.
2. Apply the RF disturbance to the EUT and record the resulting dB(SPL) level as the value of L1.
3. Calculate the interference ratio using the following formula: Acoustic Interference Ratio = L1 - L0.

**Table 3:** Signal Port : RJ45

Frequency range: 150 kHz to 80 MHz  
☒ Modulated: Amplitude 80%, 1kHz sine wave ☐ Unmodulated ☐ Other:  
 Dwell Time 1 Sec

Frequency(MHz)	Voltage Level	Pass	Fail
0.15-10	3V	A	/
10-30	3V-1V		
30-80	1V		

## 7 - ELECTRICAL FAST TRANSIENTS/BURST IEC 61000-4-4

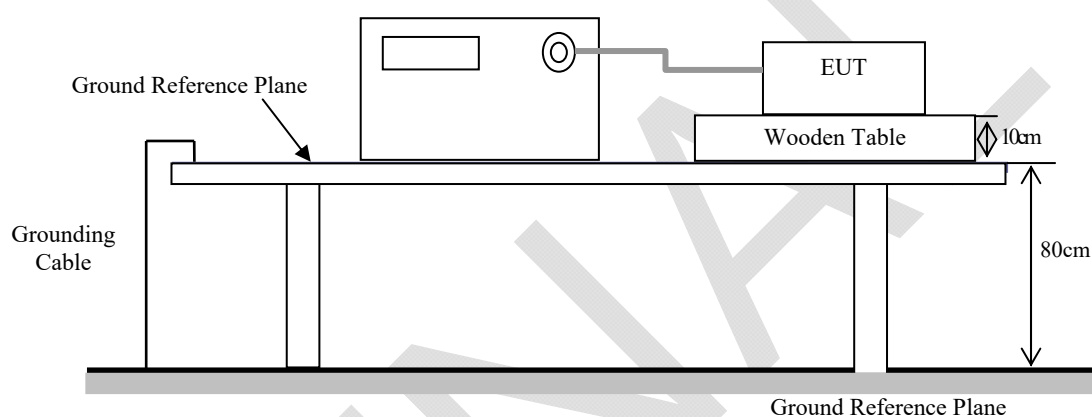
### Measurement Uncertainty

$U_{lab}$ (measurement uncertainty of lab) and  $U_{EN}$ (measurement uncertainty of EN 61000-4-4 and BS EN 61000-4-4) please refer to the following:

Parameter	$U_{EN}$	$U_{lab}$
Rise time $t_r$	6.20%	6.20%
Peak voltage value $V_p$	8.60%	8.60%
Voltage pulse width $t_w$	5.90%	5.90%

Note: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty. The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

### Test System Setup



### Test Standard

EN 55035:2017+A11:2020 (IEC 61000-4-4:2012)  
BS EN 55035:2017+A11:2020 (IEC 61000-4-4:2012)  
AC mains: Test level 2 at 1 kV;  
Signal line: Test level 2 at 0.5 kV

**Test Level**

Open Circuit Output Test Voltage $\pm 10\%$		
Level	On Power Supply Lines	On I/O (Input/Output) Signal data and control lines
1	0.5 kV	0.25 kV
2	1 kV	0.5 kV
3	2 kV	1 kV
4	4 kV	2 kV
X	Special	Special

**Performance criteria: B****Test Procedure**

The EUT was arranged for Power Line Coupling and for I/O Line Coupling through a capacitive clamp, where applicable. (Note: The I/O coupling test using a capacitive clamp is performed on the I/O interface cables that are longer in length than 3 meters.) A metal ground plane 2.4 meter by 2.0 meter was placed between the floor and the table and is connected to the earth by a 2.0 meter ground rod. The ground rod is connected to the test facility's electrical earth.



**Test Data**

*Please refer to following tables:*

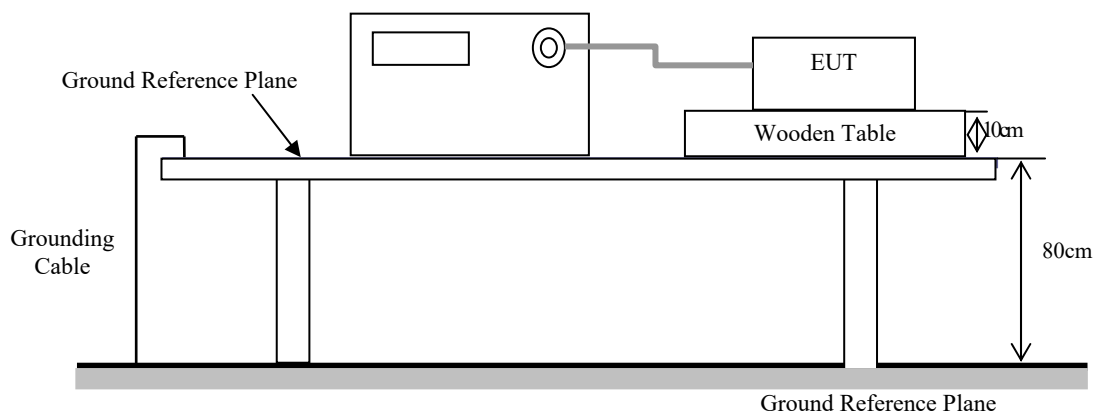
**Test Mode:** Normal working

**Note:**

Test Points		Test Level (kV)							
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0	+4.0	-4.0
AC mains power input ports	L	A	A	A	A	/	/	/	/
	N	A	A	A	A	/	/	/	/
	Earth	A	A	A	A	/	/	/	/
	L+N	A	A	A	A	/	/	/	/
	L + Earth	A	A	A	A	/	/	/	/
	N + Earth	A	A	A	A	/	/	/	/
	L+N+Earth	A	A	A	A	/	/	/	/
Signal ports	RJ45	A	A	/	/	/	/	/	/

## 8 - SURGES IEC 61000-4-5

### Test System Setup



### Test Standard

EN 55035:2017+A11:2020 (IEC 61000-4-5:2017)  
 BS EN 55035:2017+A11:2020 (IEC 61000-4-5:2017)  
 AC Mains: L-N: Test level 2 at 1kV,  
 Line-Ground: Test level 3 at 2kV;  
 Signal line: Test level at 1kV;

### Test Level

Level	Open Circuit Output Test Voltage $\pm 10\%$
1	0.5 kV
2	1 kV
3	2 kV
4	4 kV
X	Special

### Performance criteria: B

### Test Procedure

- 1) Provide disturbance signal described below is injected to EUT.
- 2) At least 5 positive and 5 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 3) Different phase angles are done individually.
- 4) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

**Test Data**

Please refer to following tables:

**Test Mode:** Normal working

**Note:**

**Table 1:** AC mains power input port

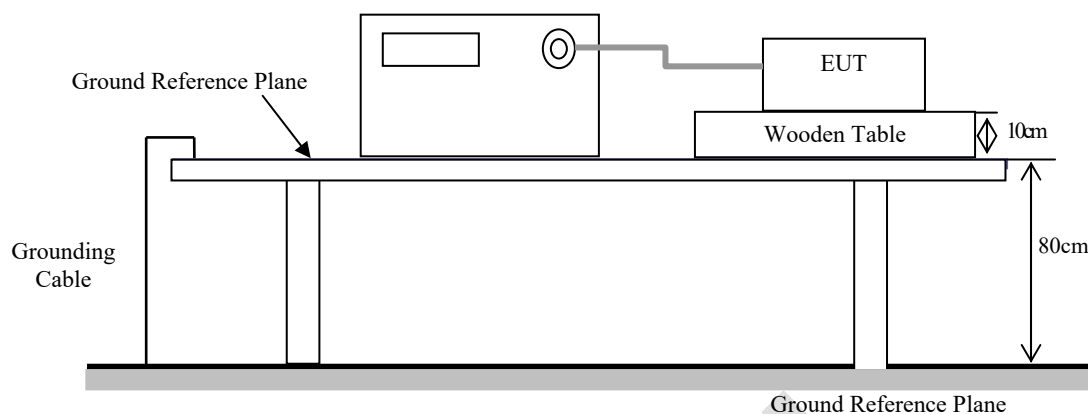
Level	Voltage	Poll	Path	Phase Angle	Pass	Fail
1	0.5kV	+	L-N,L-G	90	A	/
1	0.5kV	-	L-N,L-G	270	A	/
1	0.5kV	-	N-G	90	A	/
1	0.5kV	+	N-G	270	A	/
2	1.0kV	+	L-N,L-G	90	A	/
2	1.0kV	-	L-N,L-G	270	A	/
2	1.0kV	-	N-G	90	A	/
2	1.0kV	+	N-G	270	A	/
3	2.0kV	+	L-G	90	A	/
3	2.0kV	-	L-G	270	A	/
3	2.0kV	-	N-G	90	A	/
3	2.0kV	+	N-G	270	A	/

**Table 2:** RJ45 I/O Circuit and Lines

Level	Voltage	Poll	Path	Pass	Fail
1	0.5kV	±	Line-Ground	A	/
2	1kV	±	Line-Ground	A	/

## 9 - VOLTAGE DIPS AND SHORT INTERRUPTIONS IEC 61000-4-11

### Test Setup



### Test Standard

EN 55035:2017+A11:2020 (IEC 61000-4-11:2020)  
 BS EN 55035:2017+A11:2020 (IEC 61000-4-11:2020)  
 Test levels and Performance Criterion

### Test Level

Test Level	U2 (% Reduction)	Duration (Periods)	Performance Criteria
1	>95	0.5	B
2	30	25	C
3	>95	250	C

### Test Procedure

- 1)The interruption is introduced at selected phase angles with specified duration.
- 2)Record any degradation of performance.

**Test Data**

*Please refer to following tables:*

**Test Mode:** Normal working

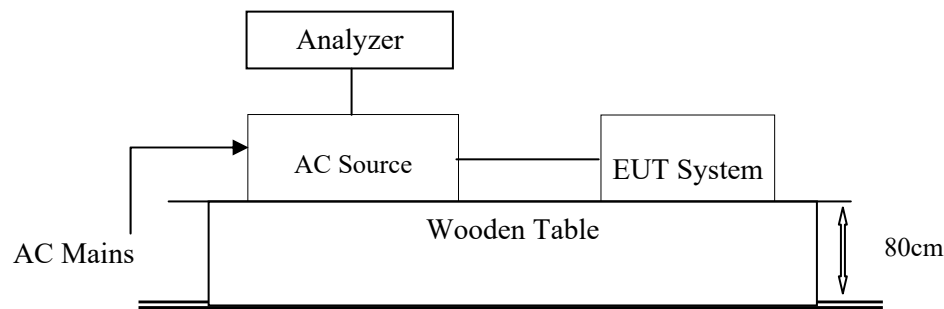
**Note:**

**Table 1: Voltage Dips/Interruptions Test**

U2 (% Reduction)	Td (Periods)	Phase Angle	N	Result
>95	0.5	0/90/180/270	3	A
30	25	0/90/180/270	3	A
>95	250	0/90/180/270	3	B

## 11 – VOLTAGE FLUCTUATIONS AND FLICKER

### Test System Setup



### Test Standard

EN 61000-3-3:2013+A1:2019

BS EN 61000-3-3:2013+A1:2019

### Flicker Test Limits :

The limits shall be applicable to voltage fluctuations and flicker at the supply terminals of the equipment under test, measured or calculated according to clause 4 under test conditions described in clause 6 and annex A. Tests made to prove compliance with the limits are considered to be type tests.

The following limits apply:

- the value of  $P_{st}$  shall not be greater than 1,0;
- the value of  $Plt$  shall not be greater than 0,65;
- the value of  $d(t)$  during a voltage change shall not exceed 3,3 % for more than 500 ms;
- the relative steady-state voltage change,  $d_c$ , shall not exceed 3,3 %;
- the maximum relative voltage change  $d_{max}$ , shall not exceed
  - a) 4 % without additional conditions;
  - b) 6 % for equipment which is:
    - switched manually, or
    - switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.

Note: The cycling frequency will be further limited by the  $P_{st}$  and  $Plt$  limit. For example: a  $d_{max}$  of 6 % producing a rectangular voltage change characteristic twice per hour will give a  $Plt$  of about 0,65.

- c) 7 % for equipment which is
  - attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or
  - switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

In the case of equipment having several separately controlled circuits in accordance with 6.6, limits b) and c) shall apply only if there is a delayed or manual restart after a power supply interruption; for all equipment with automatic switching which is energized immediately on restoration of supply after a power supply interruption, limits a) shall apply; for all equipment with manual switching, limits b) or c) shall apply depending on the rate

of switching. Pst and Plt requirements shall not be applied to voltage changes caused by manual switching. The limits shall not be applied to voltage changes associated with emergency switching or emergency interruptions.

## Test Data

*Please refer to following tables:*

Short time (Pst):	10 min
Observation time:	10 min (1 Flicker measurement)
Test Mode:	Normal working
Power Source:	AC 230V/50Hz
Test Result	PASS

## Maximum Flicker results

	EUT values	Limit	Result
Pst	0.028	1.00	PASS
Plt	0.028	0.65	PASS
dc [%]	0.037	3.30	PASS
dmax [%]	0.186	4.00	PASS
dt [s]	0.000	0.50	PASS

## EXHIBITA – EUT PHOTOGRAPHS















Port



Port





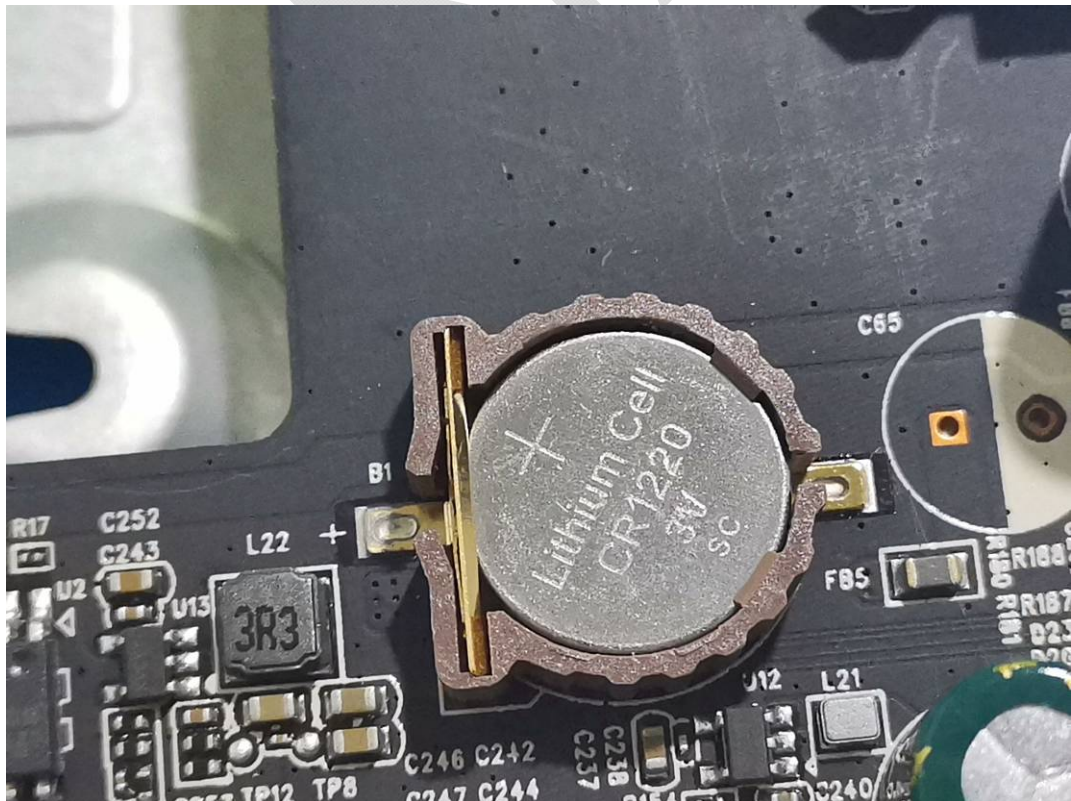
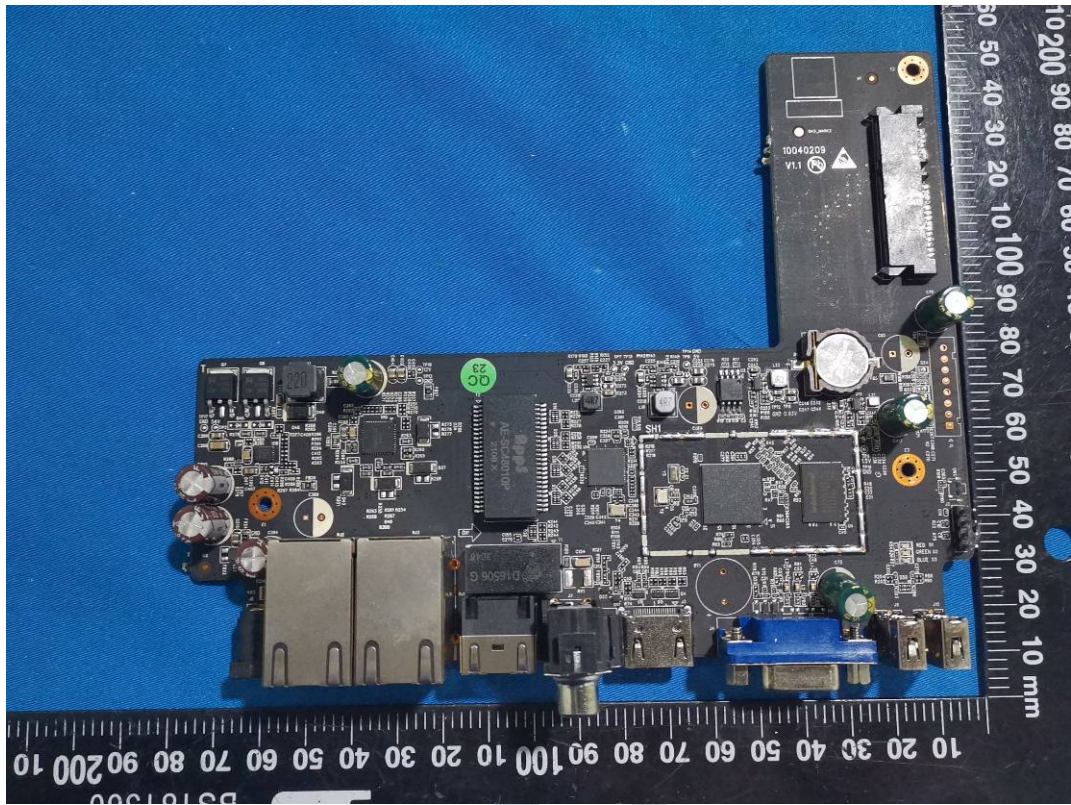
*Port*

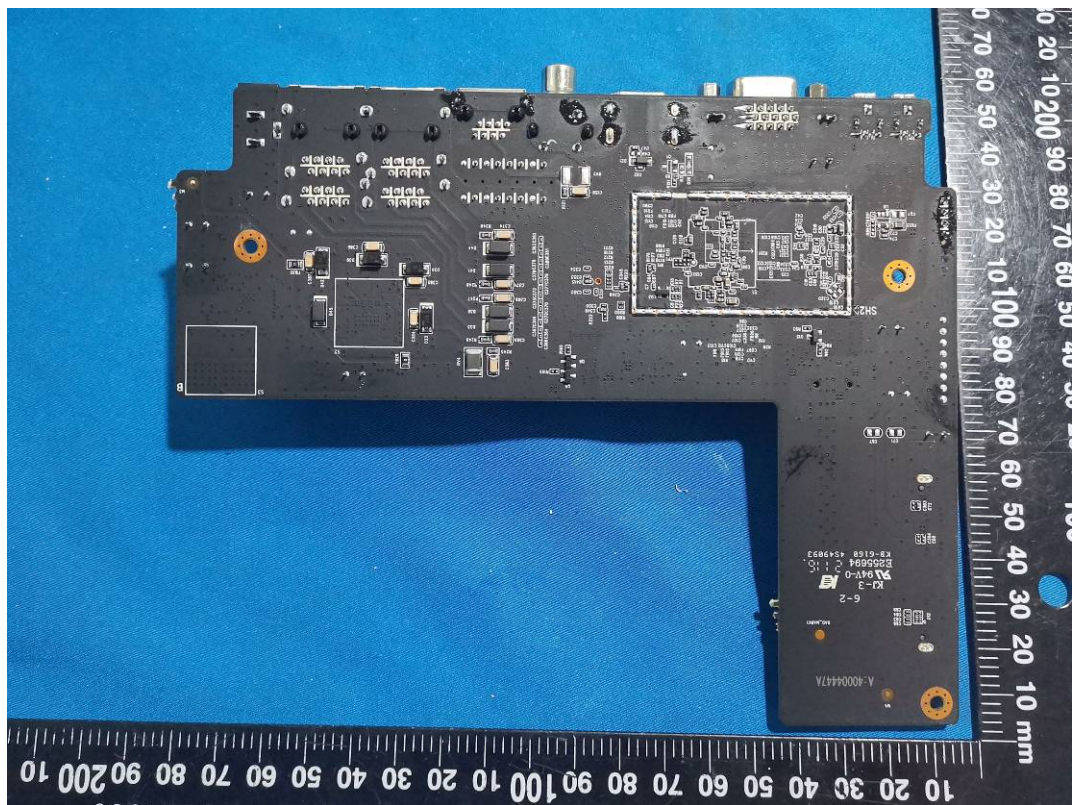


*Uncover*











## EXHIBITB – TEST SETUP PHOTOGRAPHS

### Conducted Emissions

Conducted Emissions Front View

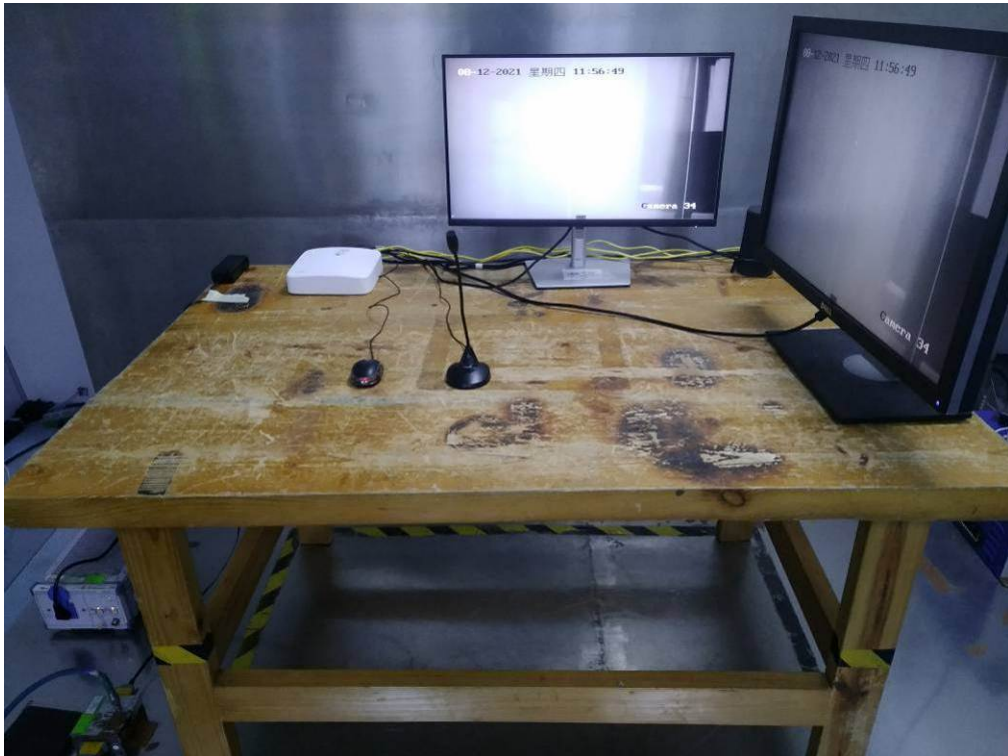


Conducted Emissions Side View





Conducted Emissions Front View-ISN



Conducted Emissions Side View-ISN

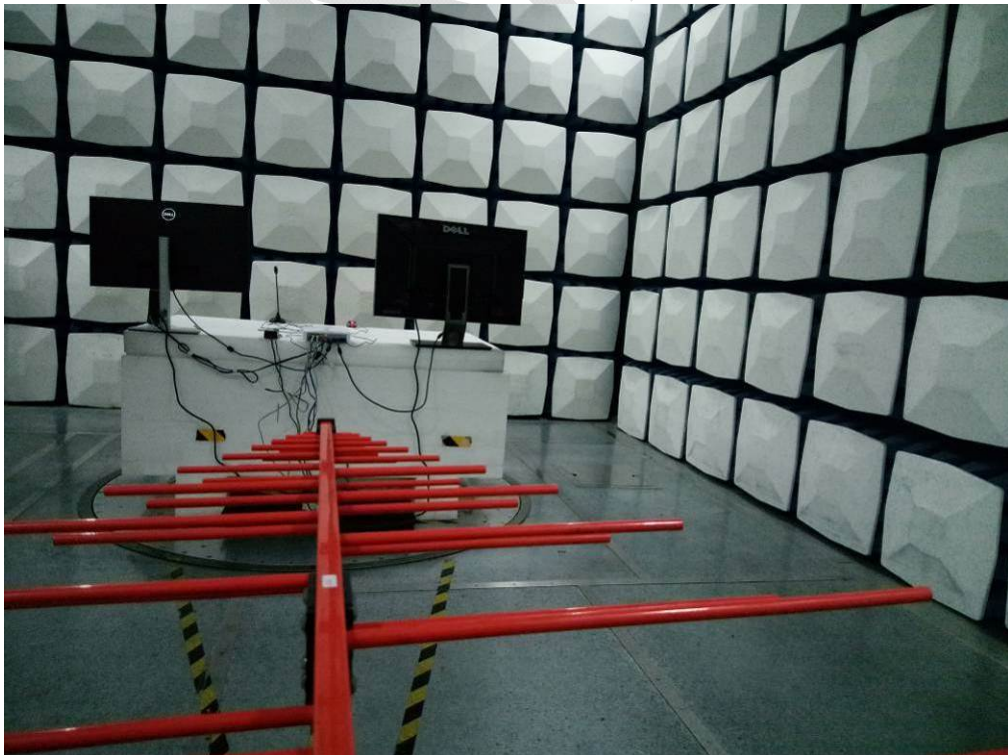


## Radiated Emission

Radiated Emission Below 1G front View

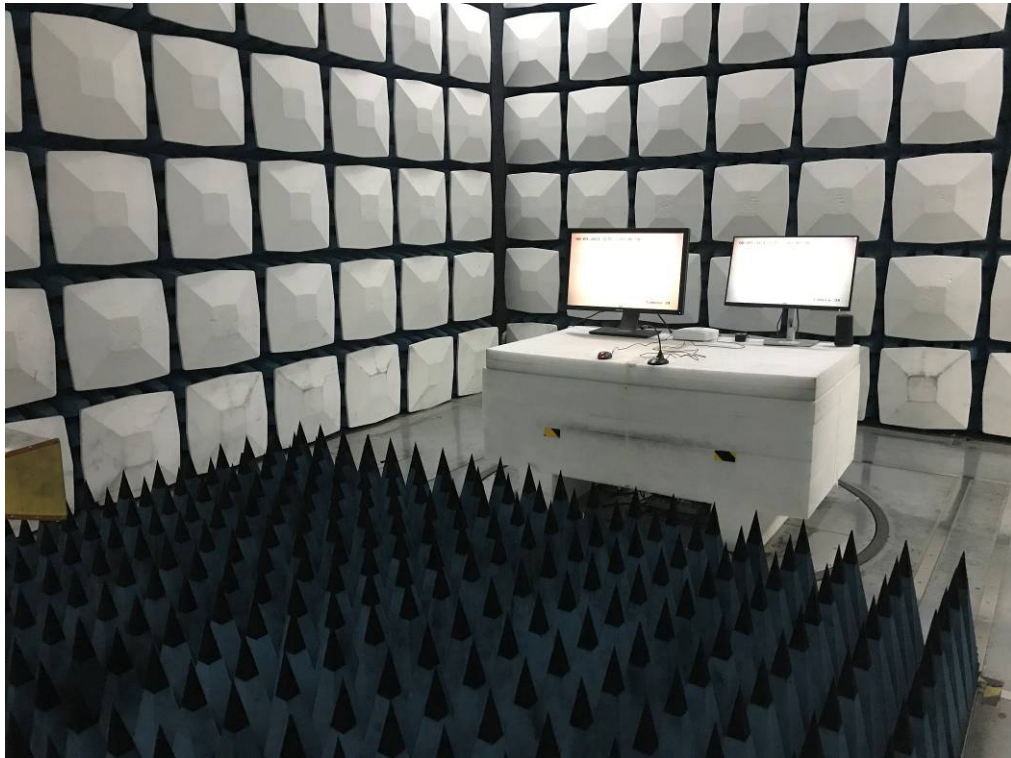


Radiated Emission Below 1G rear View

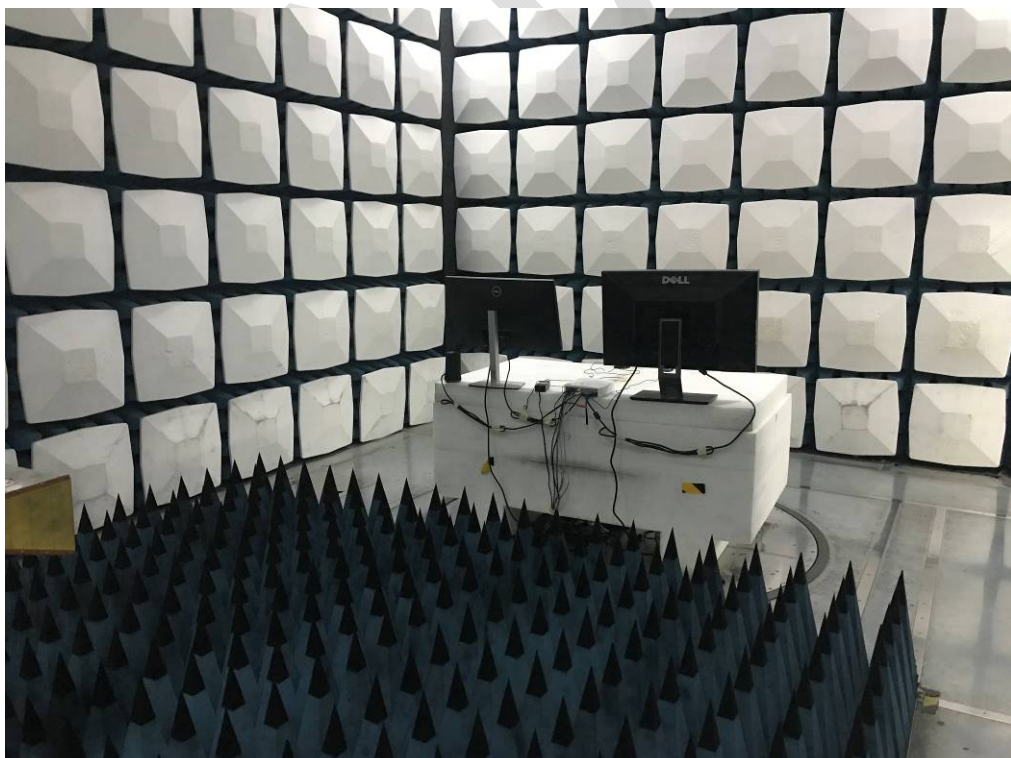




Radiated Emission above 1G front View

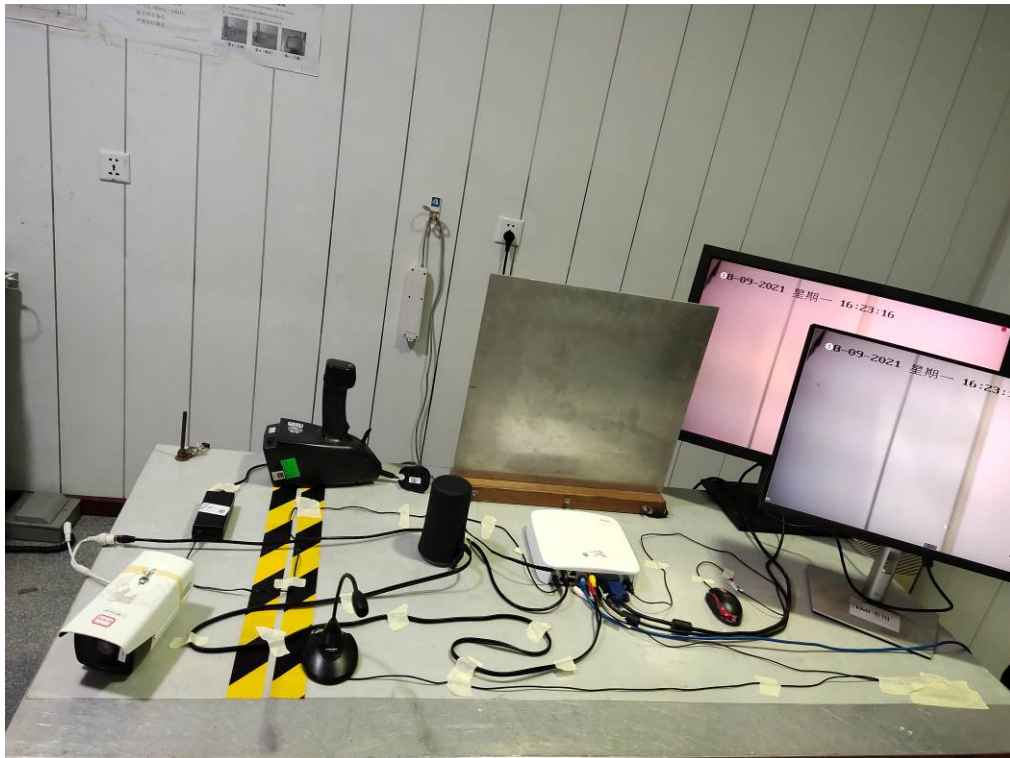


Radiated Emission above 1G rear View



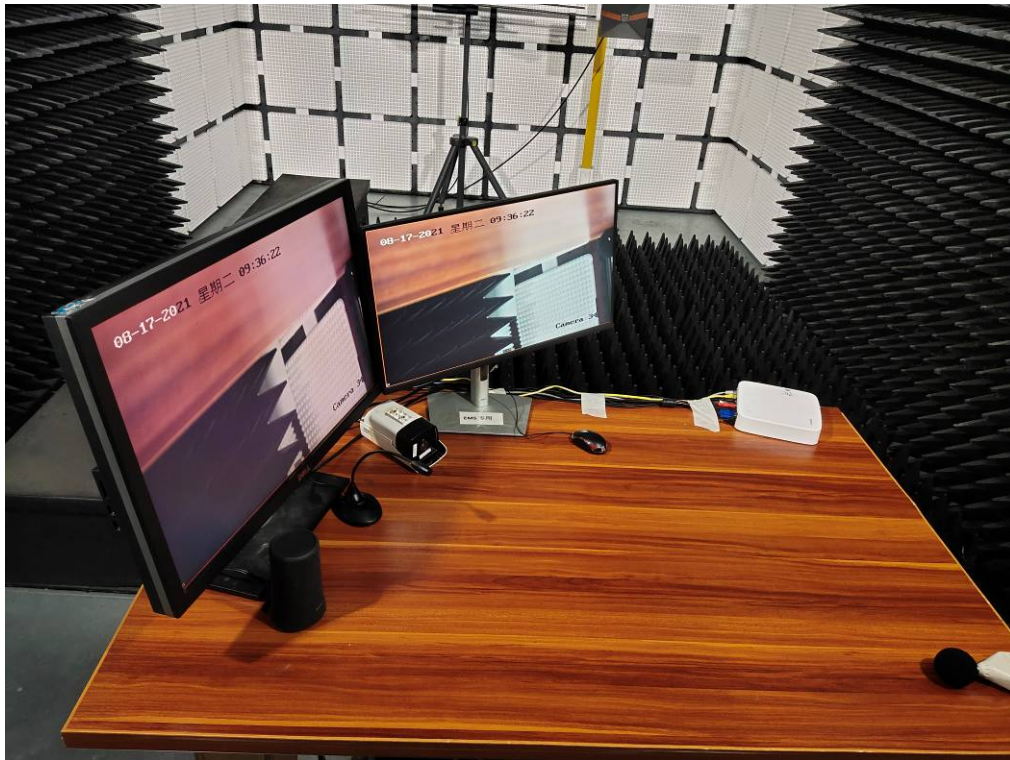
## ESD

### Test Setup Photo View



RS

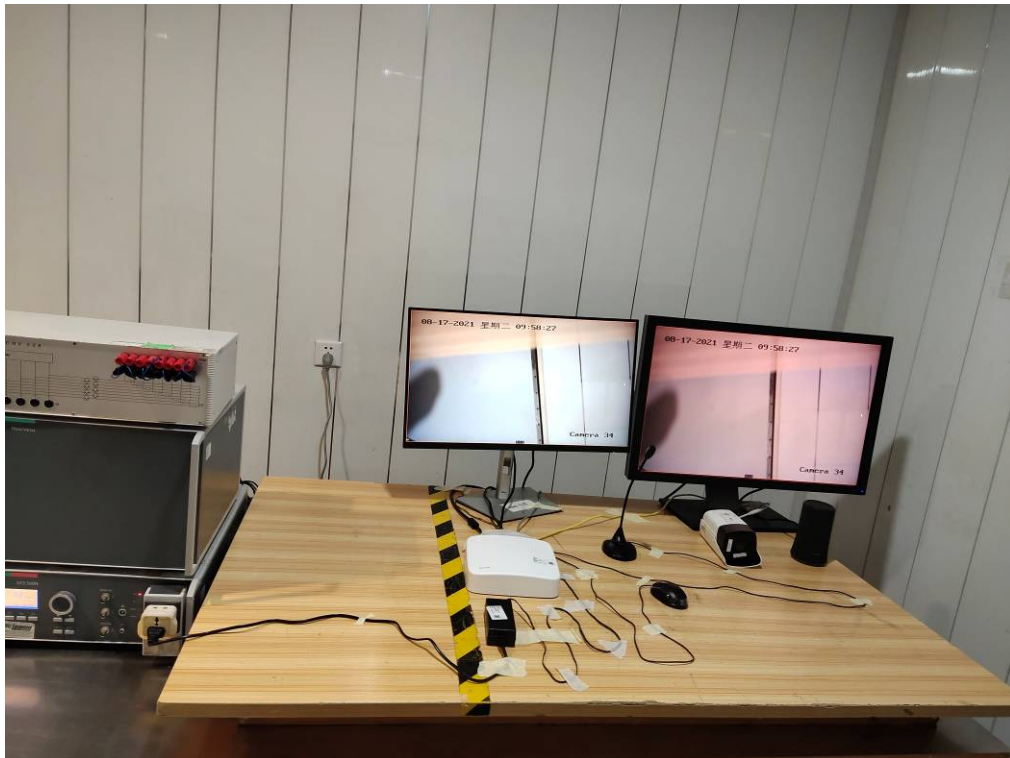
Test Setup Photo



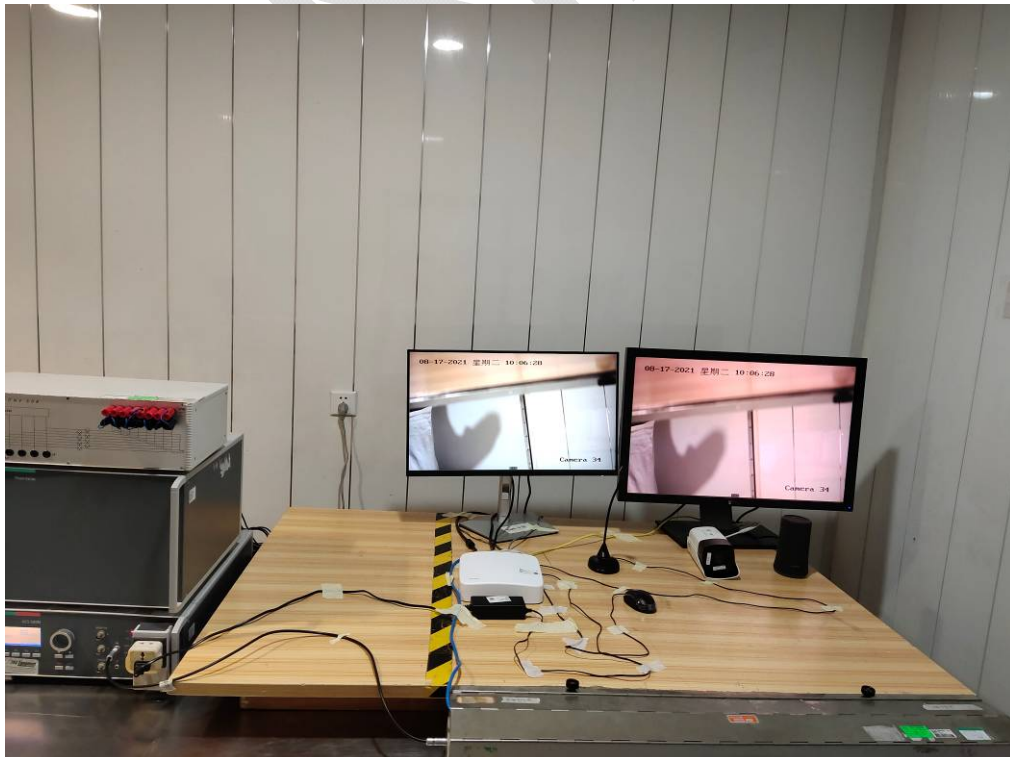


## EFT

Test Setup Photo View

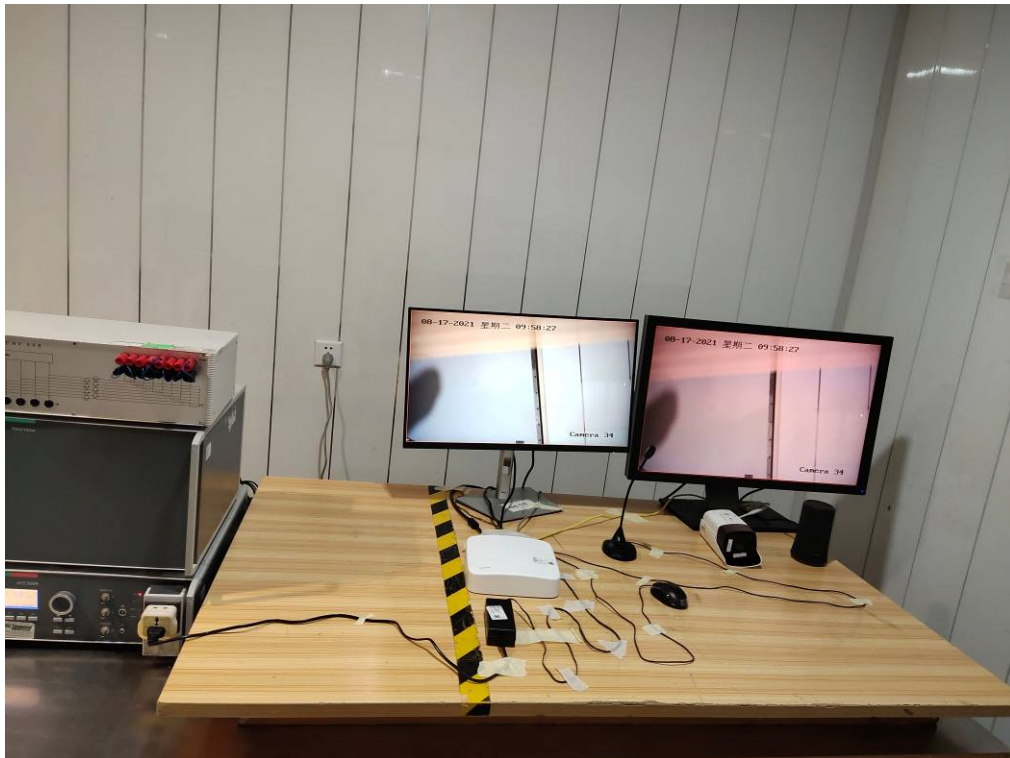


RJ45 Test Setup Photo View

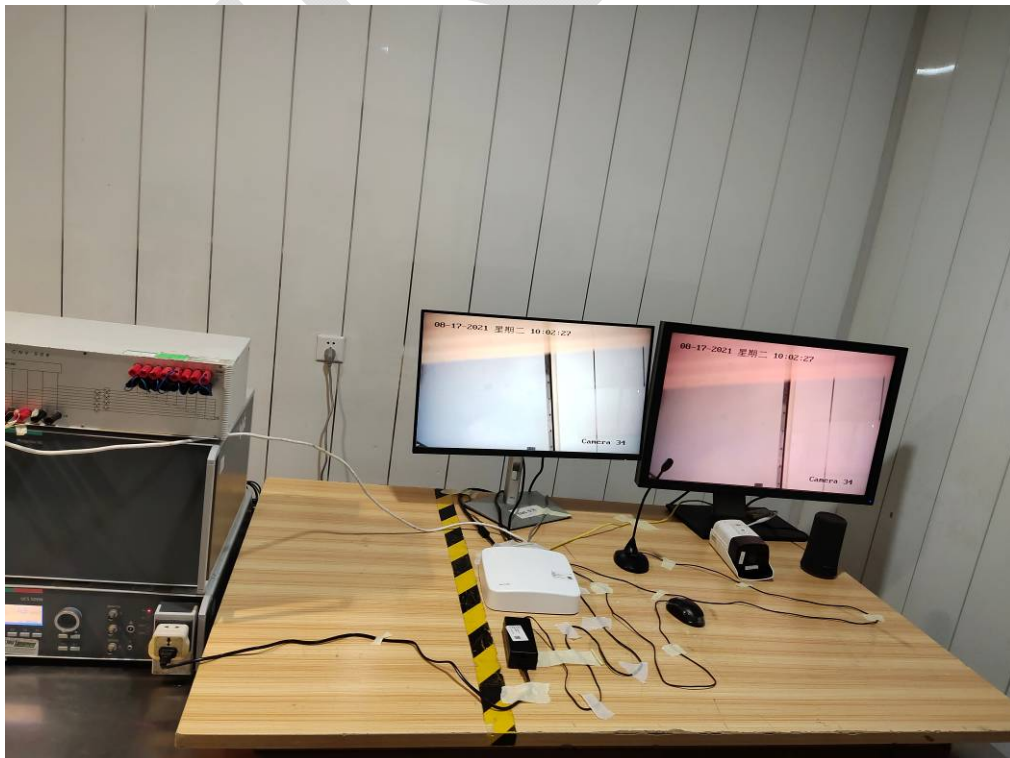


## Surge

Test Setup Photo View

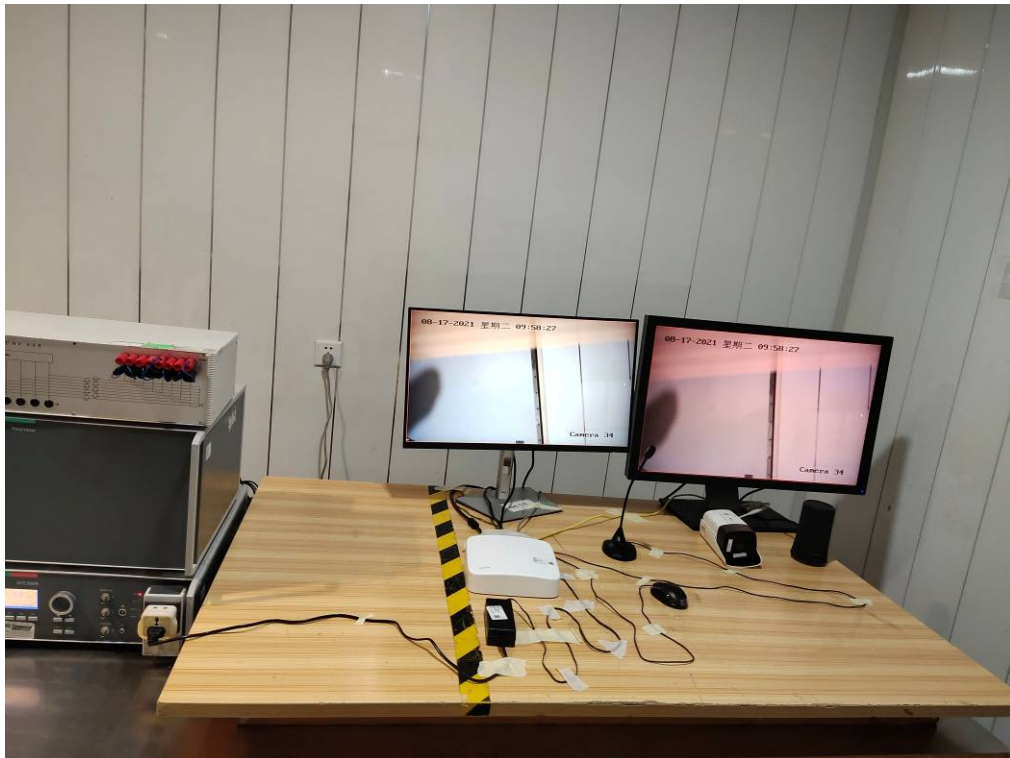


RJ45 Test Setup Photo View



## Dips

### Test Setup Photo View



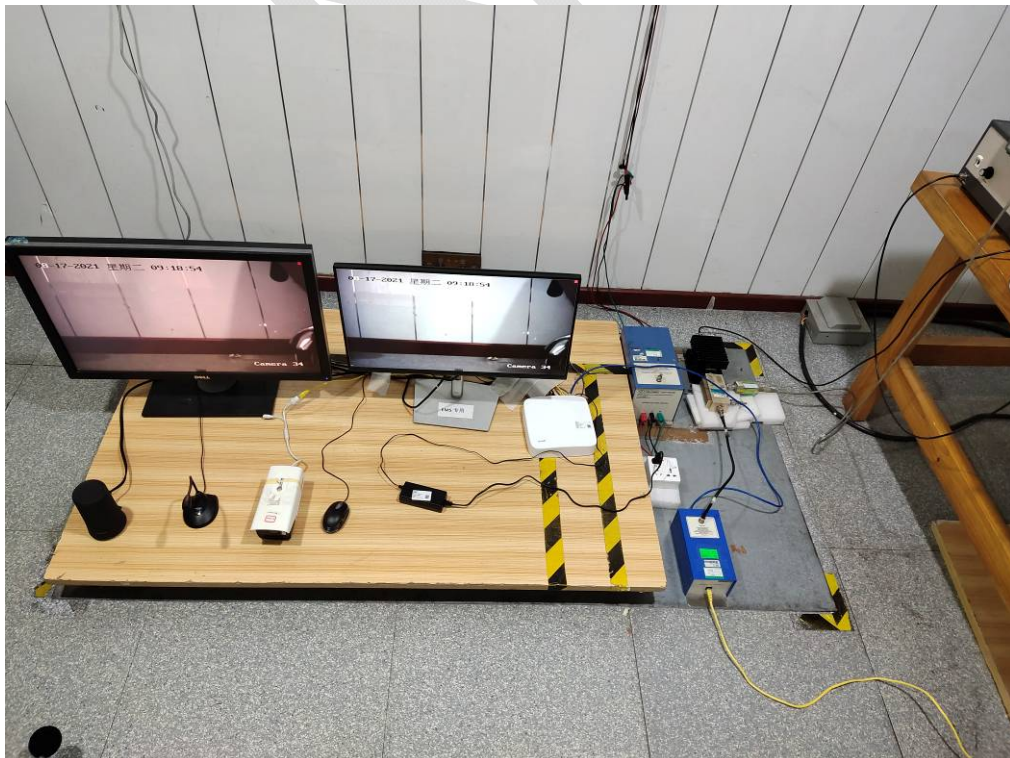


CS

Test Setup Photo View



RJ45 Test Setup Photo View



## Flicker

### Test Setup Photo View



\*\*\*\*\*END OF REPORT\*\*\*\*\*