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EMC TEST REPORT

Dates of Tests: July 21 – 28, 2020
Test Report S/N: LR500122008F
Test Site : LTA Co., Ltd.

Model No.

XRP-4210B4

APPLICANT

Hanwha Techwin Co., Ltd.

Equipment Name : NVR
Manufacturer : HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.
Model name : XRP-4210B4
Test Device Serial No.: Identification
Directive : Electromagnetic Compatibility Directive 2014/30/EU
Rule Part(s) : EN 55032:2015/AC:2016-07
EN 50130-4:2011/A1:2014
EN 61000-3-2:2014
EN 61000-3-3:2013
Data of reissue : August 05, 2020

This test report is issued under the authority of:

The test was supervised by:

Gi Won Lee, Technical Manager

Jun Hwan Park, Test Engineer

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Revision history

Revision	Date of issue	Test report No.	Description
0	05.08.2020	LR500122008F	Initial

TABLE OF CONTENTS

1. General information's	4
2. Information's about test item	5
3. Test Report	8
3.1 Summary of tests	8
3.2 EMISSION	9
3.2.1 Conducted Emissions.....	9
3.2.2 Radiated Emissions.....	16
3.2.3 Harmonic Current Emission	21
3.2.4 Voltage Fluctuations and Flicker	28
3.3 IMMUNITY	31
3.3.1 Electrostatic Discharge	31
3.3.2 RF Electromagnetic Field	34
3.3.3 Electrical Fast Transients	35
3.3.4 Surges.....	36
3.3.5 Conducted Disturbances, Induced by Radio-Frequency Fields.....	37
3.3.6 Voltage dips and Interruptions	38
3.3.7 Mains supply voltage variations	39
APPENDIX A TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS.....	40
APPENDIX B PERFORMANCE CRITERIA	44
APPENDIX C PHOTOGRAPHS	47

1. General information's

1-1 Test Performed

Company name : **LTA Co., Ltd**
 Address : 4, Songju-ro 236beon-gil, Yangji-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, 17159, Korea
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Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which “General requirements for the competents of calibration and testing laboratory”.

1-2 Accredited agencies

LTA Co., Ltd. is approved to perform EMC testing by the following agencies:

Agency	Country	Accreditation No.	Validity	Reference
NVLAP	U.S.A	200723-0	2020-09-30	ECT accredited Lab.
RRA	KOREA	KR0049	-	RRA accredited Lab.
	U.S.A		2021-04-11	
	CANADA		2021-06-16	
	VIETNAM		2021-04-12	
VCCI	JAPAN	C-14948	2023-09-10	VCCI registration
		T-12416	2023-09-10	
		R-14483	2023-10-15	
		G-10847	2021-12-13	
KOLAS	KOREA	KT551	2021-08-20	KOLAS accredited Lab.

2. Information's about test item

2-1 Client/ Manufacturer

Company name : Hanwha Techwin Co., Ltd.
 Address : 6, Pangyo-ro 319 Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13488, KOREA
 Telephone / Facsimile : +82-70-7147-8753(<http://hanhwa-security.com>)

Factory #1

Company name : HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.
 Address : Lot O-2, Que Vo Industrial Zone extended area ,Nam Son commune, Bac Ninh city,Bac Ninh province, Vietnam

Factory #2

Company name : D-TECH CO.,LTD.
 Address : 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi-do, Korea (Suwon Industrial Complex)

2-2 Equipment Under Test (EUT)

Class : A
 Equipment Name : NVR
 Model name : XRP-4210B4
 Serial number : Identification
 Date of receipt : July 15, 2020
 EUT condition : Pre-production, not damaged
 Interface Ports : AC IN, LAN, HDMI, USB 3.0, USB 2.0, HDD, AUDIO OUT, HDD
 Power rating : AC 230 V, 50 Hz

2-3 Modification

- NONE

2-4 Model Specification

- NONE

2-5 Test conditions

Temp. / Humid. / Pressure : (21 - 25) °C / (49 - 54) % R.H. / (100.1 – 100.3) kPa
 Tested Model : XRP-4210B4
 Test mode : REC mode
 Tested Voltage : AC 230 V, 50 Hz

2-6 List of EUT and ACCESSORY

EUT				
Equipment Name	Model Name	Serial No.	Manufacturer	Remarks
NVR	XRP-4210B4	N/A	HANWHA TECHWIN SECURITY VIETNAM CO.,LTD. D-TECH CO.,LTD.	-
Keyboard	PKB-650U	N/A	SHENZHEN TYCHO TECHNOLOGY CO., LIMITED	-
Mouse	MOKJUO	N/A	PRIMAX ELECTRONICS LTD	-
ACCESSORY				
Equipment Name	Model Name	Serial No.	Manufacturer	Remarks
Monitor #1	P2018H	N/A	DELL	-
Monitor #2	24MA53D	N/A	LG	-
Monitor #2 Adapter	A11-120P1A	N/A	Chicony	-
Speaker	MINI-X3	N/A	Shenzhen Music Technology Co., Ltd	-
Notebook	TFG13	N/A	HANSUNG	-
Switch Hub	H608	N/A	ipTIME	-
Switch Hub Adapter	DCP015A050600K	N/A	Zioncom Electronics	-
Network Camera	QNV-6082R	N/A	HANWHA TECHWIN CO.,LTD.	-
PoE Injector	SFC501G	N/A	SOLTECH INFONET INC.	-
USB Memory Stick #1	Ultra Flair CZ73 32GB	N/A	SanDisk	64 GB
USB Memory Stick #2	Ultra Z48USB 3.0 32GB	N/A	SanDisk	64 GB
HDD	WD40PURX- 64N96Y0	N/A	Western Digital	4 TB

2-7 Cable List

Cable List						
From		To		Length (m)	Shielding	
Type	I/O Port	Type	I/O Port		Cable	backshell
EUT	AC IN	AC Power Source	3 Pin AC Line	1.5	NO	Plastic
	LAN #1	Poe Injector	LAN	3.0	NO	Plastic
	LAN #2	Switch Hub	LAN	3.0	NO	Plastic
	LAN #3	Switch Hub	LAN	3.0	NO	Plastic
	USB 2.0 #1	Keyboard	-	1.5	NO	Plastic
	USB 2.0 #2	Mouse	-	1.5	NO	Plastic
	USB 3.0 #1	USB Memory Stick #1	-	-	-	Metal
	USB 3.0 #2	USB Memory Stick #2	-	-	-	Plastic
	AUDIO OUT	Speaker	AUDIO IN	1.0	NO	Plastic
	HDMI #1	Monitor #1	HDMI	1.5	YES	Plastic
	HDMI #2	Monitor #2	HDMI	1.5	YES	Plastic
	HDD	HDD	-	-	-	-
Switch Hub	LAN	Notebook	LAN	2.0	NO	Plastic
	DC IN	Switch Hub Adapter	DC OUT	1.5	NO	Plastic
Switch Hub Adapter	AC IN	AC Power Source	2 Pin AC Line	-	-	Plastic
Monitor #1	AC IN	AC Power Source	3 Pin AC Line	1.5	NO	Plastic
Monitor #2	DC IN	Monitor #2 Adapter	DC OUT	1.3	NO	Plastic
Monitor #2 Adapter	AC IN	AC Power Source	3 Pin AC Line	1.5	NO	Plastic
PoE Injector	PoE	Network Camera	PoE	2.0	NO	Plastic
	AC IN	AC Power Source	3 Pin AC Line	1.5	NO	Plastic
Notebook	-	-	-	-	-	-

3. Test Report

3.1 Summary of tests

Reference	Parameter	Status (note)
I. Emission		
Conducted Emissions	EN 55032:2015/AC:2016-07	C
Radiated Emissions	EN 55032:2015/AC:2016-07	C
Harmonic Current Emission	EN 61000-3-2:2014	C
Voltage Fluctuations and Flicker	EN 61000-3-3:2013	C
II. Immunity (EN 50130-4:2011/A1:2014)		
Electrostatic Discharge	EN 61000-4-2:2009	C
RF Electromagnetic Field	EN 61000-4-3:2006/A1:2008/A2:2010	C
Electrical Fast Transients	EN 61000-4-4:2012	C
Surges	EN 61000-4-5:2014/A1:2017	C
Conducted Disturbances, Induced by Radio-Frequency Fields	EN 61000-4-6:2014/AC:2015	C
Voltage dips and Interruptions	EN 61000-4-11:2004/A1:2017	C
Main supply voltage variations	EN 50130-4:2011/A1:2014	C

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: The data in this test report are traceable to the national or international standards.

3.2 EMISSION

3.2.1 Conducted Emissions

Definition:

The test assesses the ability of the EUT to limit its internal noise from being present on the AC mains Power In/Output ports.

We were performed the test according to LTA procedure LTA-QI-04.

Measurement Frequency range	: 150 kHz – 30 MHz
Test method	: EN 55032:2015/AC:2016-07
Measurement RBW	: 9 kHz
Test mode	: REC mode
Result	: Complies

Measurement Data:

- Refer to the Next page (Maximum emission configuration)

A sample calculation:

COR. F (correction factor)= LISN Insertion loss + Cable loss + Pulse Limiter Factors

Emission Level= meter reading + COR.F

Limits for conducted disturbance at the mains ports of class A ITE

Frequency Range	Quasi-peak	Average
(0.15 – 0.5) MHz	79 dB μ V	66 dB μ V
(0.5 – 30) MHz	73 dB μ V	60 dB μ V

Note: The limits will decrease with the frequency logarithmically within 0.15 MHz to 0.5 MHz

Limits for conducted disturbance at the mains ports of class B ITE

Frequency Range	Quasi-peak	Average
(0.15 – 0.5) MHz	(66 – 56) dB μ V	(56 - 46) dB μ V
(0.5 – 5) MHz	56 dB μ V	46 dB μ V
(5 – 30) MHz	60 dB μ V	50 dB μ V

Note: The limits will decrease with the frequency logarithmically within 0.15 MHz to 0.5 MHz

Limits of conducted common mode (asymmetric mode) disturbance at telecommunication ports in the frequency range 0.15 MHz to 30 MHz for class A equipment

Frequency Range	Voltage limits		Current limits	
	Quasi-peak	Average	Quasi-peak	Average
(0.15 – 0.5) MHz	(97 – 87) dB μ V	(84 – 74) dB μ V	(53 – 43) dB μ V	(40 – 30) dB μ V
(0.5 – 30) MHz	87 dB μ V	74 dB μ V	43 dB μ V	30 dB μ V

Note 1: The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

Note 2: The current and voltage disturbance limits are derived for use with an impedance stabilization network (ISN) which presents a common mode (asymmetric mode) impedance of 150 Ω to the telecommunication port under test (conversion factor is $20 \log_{10} 150/I = 44$ dB)

Limits of conducted common mode (asymmetric mode) disturbance at telecommunication ports in the frequency range 0.15 MHz to 30 MHz for class B equipment

Frequency Range	Voltage limits		Current limits	
	Quasi-peak	Average	Quasi-peak	Average
(0.15 – 0.5) MHz	(84 – 74) dB μ V	(74 – 64) dB μ V	(40 – 30) dB μ V	(30 – 20) dB μ V
(0.5 – 30) MHz	74 dB μ V	64 dB μ V	30 dB μ V	20 dB μ V

Note 1: The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

Note 2: The current and voltage disturbance limits are derived for use with an impedance stabilization network (ISN) which presents a common mode (asymmetric mode) impedance of 150 Ω to the telecommunication port under test (conversion factor is $20 \log_{10} 150/I = 44$ dB)

Conducted Emissions (LINE)



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449-822 Korea
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EUT /Model No. : XRP-4210B4

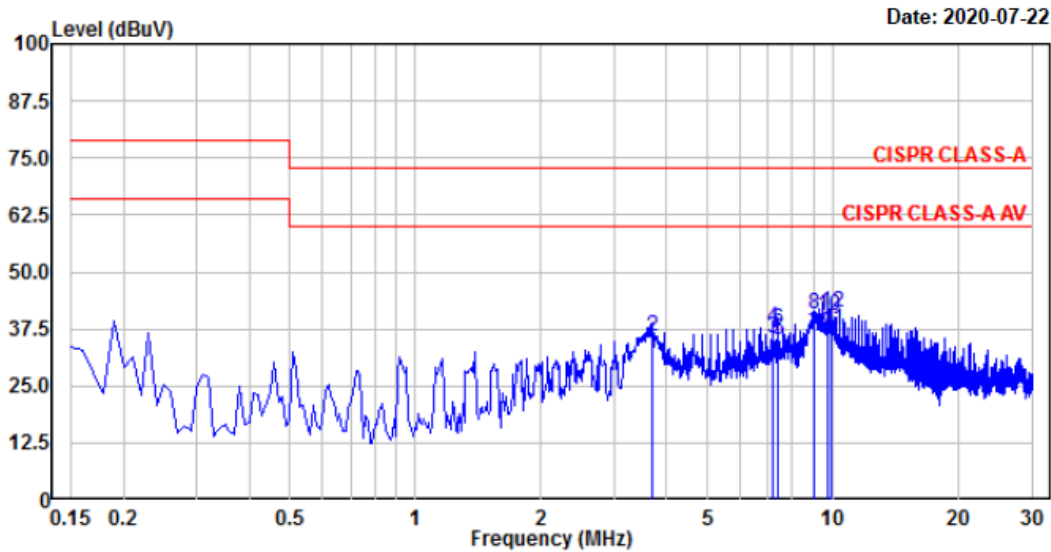
Phase : Line

Test Mode : REC mode

Test Power : 230 V / 50 Hz

Temp./ Humi. : 23 'C / 51 % R.H.

Test Engineer : PARK J H



No.	Freq MHz	RD QP dBUV	RD AV dBUV	C.F dB	Result QP dBUV	Result AV dBUV	Limit QP dBUV	Limit AV dBUV	Margin QP dB	Margin AV dB	Phase
2.	3.703	16.19	12.49	19.67	35.86	32.16	73.00	60.00	37.14	27.84	Line
4.	7.167	17.85	15.86	19.78	37.63	35.64	73.00	60.00	35.37	24.36	Line
6.	7.399	17.45	15.29	19.79	37.24	35.08	73.00	60.00	35.76	24.92	Line
8.	9.015	20.73	16.30	19.86	40.59	36.16	73.00	60.00	32.41	23.84	Line
10.	9.708	20.31	16.73	19.88	40.19	36.61	73.00	60.00	32.81	23.39	Line
12.	9.940	21.33	17.58	19.88	41.21	37.46	73.00	60.00	31.79	22.54	Line

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

Conducted Emissions (NEUTRAL)



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EUT /Model No. : XRP-4210B4

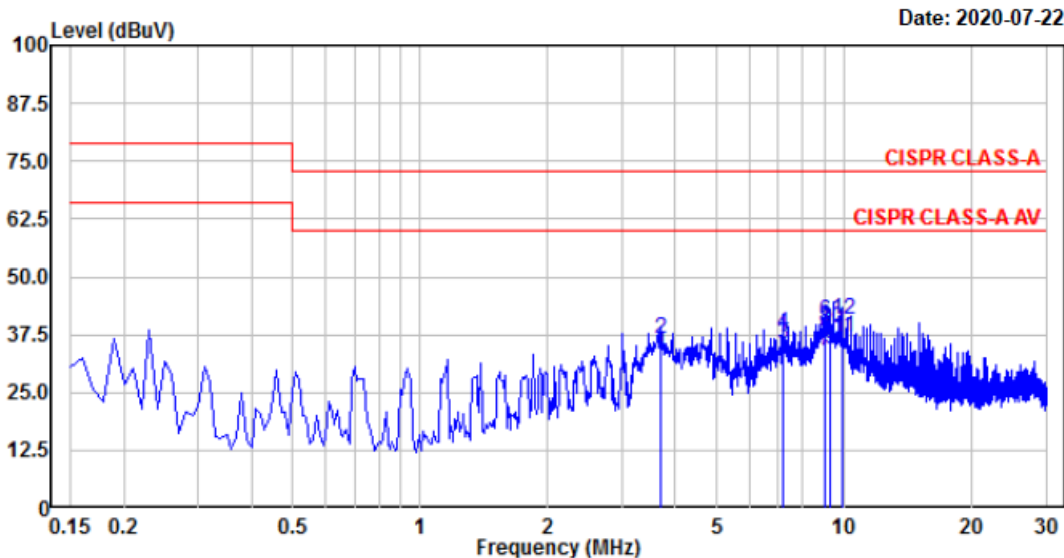
Phase : Neutral

Test Mode : REC mode

Test Power : 230 V / 50 Hz

Temp./ Humi. : 23 'C / 51 % R.H.

Test Engineer : PARK J H



No.	Freq MHz	RD QP dBuV	RD AV dBuV	C.F dB	Result QP dBuV	Result AV dBuV	Limit QP dBuV	Limit AV dBuV	Margin QP dB	Margin AV dB	Phase
2.	3.702	17.09	13.48	19.70	36.79	33.18	73.00	60.00	36.21	26.82	neutral
4.	7.166	18.00	15.71	19.81	37.81	35.52	73.00	60.00	35.19	24.48	neutral
6.	9.016	20.64	16.61	19.89	40.53	36.50	73.00	60.00	32.47	23.50	neutral
8.	9.019	18.85	14.20	19.89	38.74	34.09	73.00	60.00	34.26	25.91	neutral
10.	9.249	19.14	14.47	19.91	39.05	34.38	73.00	60.00	33.95	25.62	neutral
12.	9.942	20.80	17.13	19.92	40.72	37.05	73.00	60.00	32.28	22.95	neutral

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

Conducted Emissions (TEL_1000 M) / LAN #1



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EUT /Model No. : XRP-4210B4

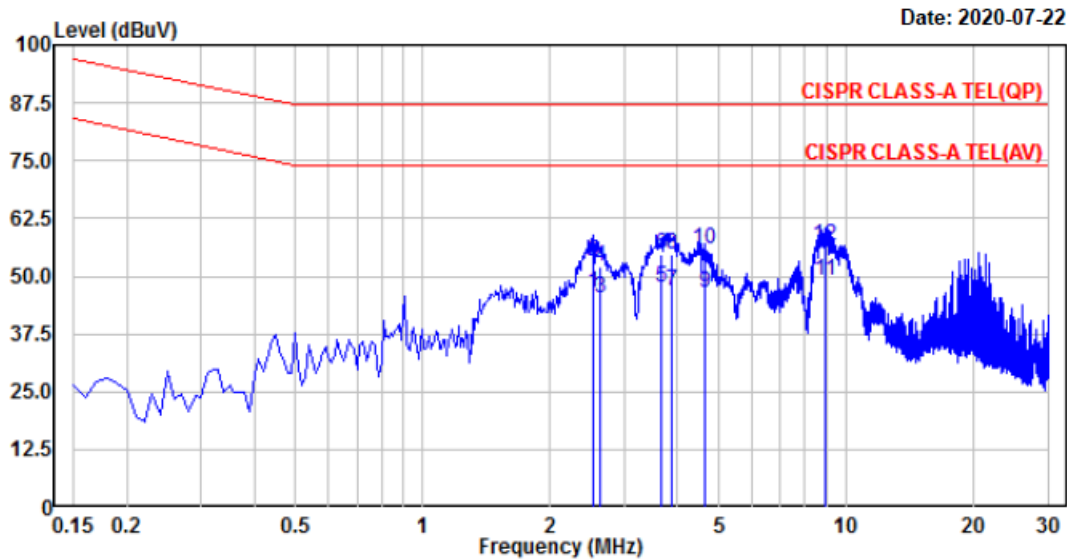
Phase : TEL_1000M(LAN #1)

Test Mode : REC mode

Test Power : 230 V / 50 Hz

Temp./ Humi. : 23 'C / 51 % R.H.

Test Engineer : PARK J H



No.	Freq MHz	RD QP dBuV	RD AV dBuV	C.F dB	Result QP dBuV	Result AV dBuV	Limit QP dBuV	Limit AV dBuV	Margin QP dB	Margin AV dB	Phase
2.	2.519	33.85	27.14	19.39	53.24	46.53	87.00	74.00	33.76	27.47	Line
4.	2.621	32.75	25.91	19.39	52.14	45.30	87.00	74.00	34.86	28.70	Line
6.	3.660	35.19	28.08	19.40	54.59	47.48	87.00	74.00	32.41	26.52	Line
8.	3.863	35.32	27.41	19.41	54.73	46.82	87.00	74.00	32.27	27.18	Line
10.	4.621	36.40	26.83	19.42	55.82	46.25	87.00	74.00	31.18	27.75	Line
12.	8.887	37.07	29.72	19.52	56.59	49.24	87.00	74.00	30.41	24.76	Line

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

Conducted Emissions (TEL_1000 M) / LAN #2



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EUT /Model No. : XRP-4210B4

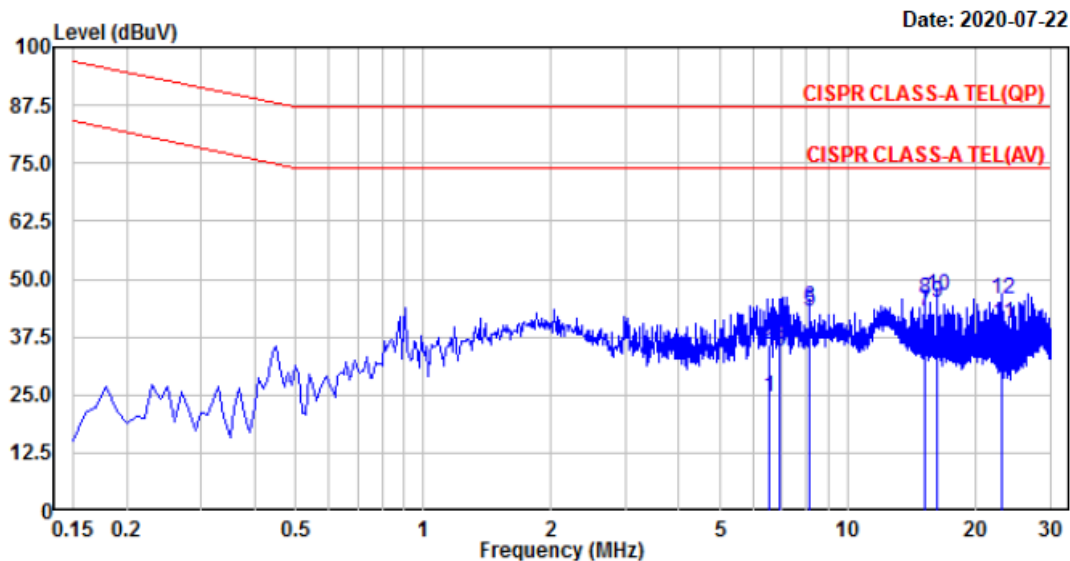
Phase : TEL_1000M(LAN #2)

Test Mode : REC mode

Test Power : 230 V / 50 Hz

Temp./ Humi. : 23 'C / 51 % R.H.

Test Engineer : PARK J H



No.	Freq MHz	RD QP dBuV	RD AV dBuV	C.F dB	Result QP dBuV	Result AV dBuV	Limit QP dBuV	Limit AV dBuV	Margin QP dB	Margin AV dB	Phase
2.	6.501	16.39	5.20	19.44	35.83	24.64	87.00	74.00	51.17	49.36	Line
4.	6.939	18.59	14.98	19.45	38.04	34.43	87.00	74.00	48.96	39.57	Line
6.	8.098	24.40	23.38	19.48	43.88	42.86	87.00	74.00	43.12	31.14	Line
8.	15.249	25.96	23.51	19.66	45.62	43.17	87.00	74.00	41.38	30.83	Line
10.	16.227	26.74	25.23	19.69	46.43	44.92	87.00	74.00	40.57	29.08	Line
12.	23.127	25.66	20.73	19.83	45.49	40.56	87.00	74.00	41.51	33.44	Line

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

Conducted Emissions (TEL_1000 M) / LAN #3



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EUT /Model No. : XRP-4210B4

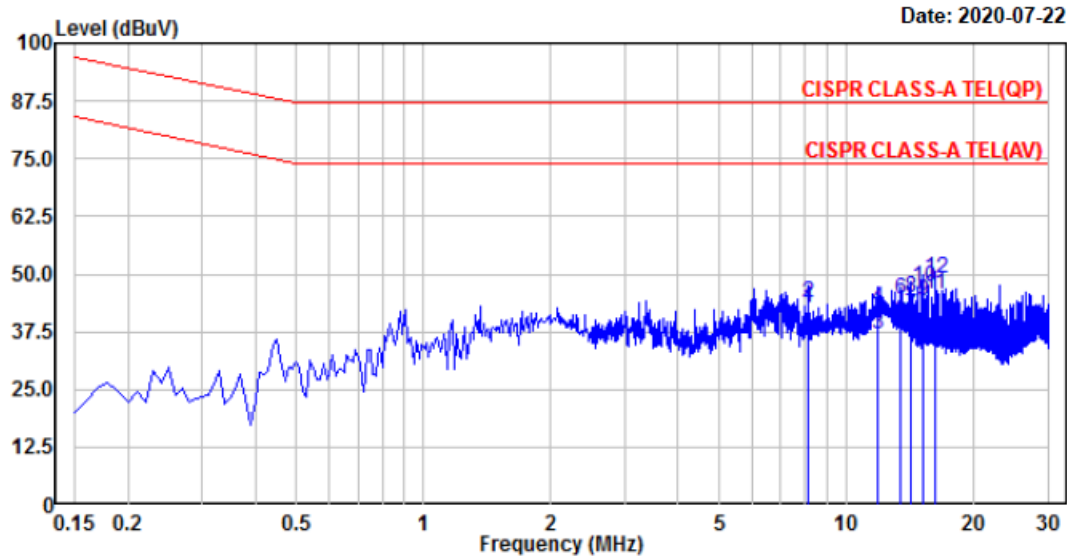
Phase : TEL_1000M(LAN #3)

Test Mode : REC mode

Test Power : 230 V / 50 Hz

Temp./ Humi. : 23 'C / 51 % R.H.

Test Engineer : PARK J H



No.	Freq MHz	RD QP dBuV	RD AV dBuV	C.F dB	Result QP dBuV	Result AV dBuV	Limit QP dBuV	Limit AV dBuV	Margin QP dB	Margin AV dB	Phase
2.	8.099	24.41	23.17	19.48	43.89	42.65	87.00	74.00	43.11	31.35	Line
4.	11.893	22.94	17.55	19.59	42.53	37.14	87.00	74.00	44.47	36.86	Line
6.	13.418	24.94	19.66	19.62	44.56	39.28	87.00	74.00	42.44	34.72	Line
8.	14.214	25.35	21.66	19.65	45.00	41.31	87.00	74.00	42.00	32.69	Line
10.	15.252	27.35	24.46	19.66	47.01	44.12	87.00	74.00	39.99	29.88	Line
12.	16.227	29.36	25.85	19.69	49.05	45.54	87.00	74.00	37.95	28.46	Line

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

3.2.2 Radiated Emissions

Definition:

The test assesses the ability of ancillary equipment to limit their internal noise from being radiated from the enclosure.
We were performed the test according to LTA procedure LTA-QI-04.

Test method	: EN 55032:2015/AC:2016-07
Measuring Distance	: 10 m below 1 GHz / 3 m above 1 GHz
Measurement Frequency range	: 30 MHz – 6 000 MHz
Measurement RBW	: 120 kHz @ 10 m / 1 MHz @ 3 m
Test mode	: REC mode
Result	: Complies

Measurement Data:

- Refer to the Next page (Maximum emission configuration)
- The highest internal source of an EUT is higher than 108 MHz, the measurement shall be made up to 6 GHz.
(The highest internal source of an EUT : 4 GHz)

A sample calculation:

COR. F (correction factor)= Antenna factor + Cable loss- Amp.gain- Distance correction

Emission Level= meter reading + COR.F

Limit of 10 m below 1 GHz

CLASS A

Frequency Range	Quasi-peak
(30 – 230) MHz	40 dB μ V/m
(230 – 1 000) MHz	47 dB μ V/m

CLASS B

Frequency Range	Quasi-peak
(30 – 230) MHz	30 dB μ V/m
(230 – 1 000) MHz	37 dB μ V/m

Limit of 3m above 1 GHz

CLASS A

Frequency Range	Average Limit @ 3m (dB μ V/m)	Peak limit @ 3m (dB μ V/m)
(1 000 – 3 000) MHz	56	76
(3 000 – 6 000) MHz	60	80

NOTE: The lower limit applies at the transition frequency.

CLASS B

Frequency Range	Average Limit @ 3m (dB μ V/m)	Peak limit @ 3m (dB μ V/m)
(1 000 – 3 000) MHz	50	70
(3 000 – 6 000) MHz	54	74

NOTE: The lower limit applies at the transition frequency.

Radiated Emissions (Below 1 GHz) / V



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EUT/Model No.: XRP-4210B4

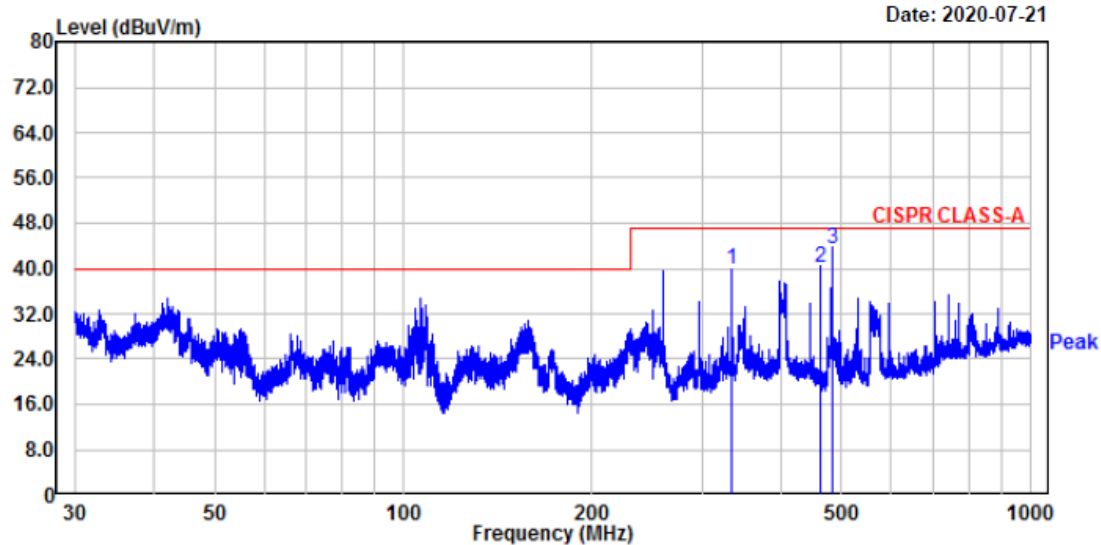
Temp/Humi: 21 'C / 54 % R.H.

Test Mode : REC mode

Tested by: PARK J H

Power : 230 V / 50 Hz

Date: 2020-07-21



No.	Freq MHz	Reading dBμV	C.F dB	Result QP dBμV/m	Limit dBμV/m	Margin dB	Height cm	Angle deg	Polarity
1.	334.13	49.52	-9.70	39.82	47.00	7.18	104	45	vertical
2.	462.14	47.55	-7.27	40.28	47.00	6.72	107	337	vertical
3.	482.64	50.69	-7.14	43.55	47.00	3.45	106	324	vertical

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

Radiated Emissions (Below 1 GHz) / H



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EUT/Model No.: XRP-4210B4

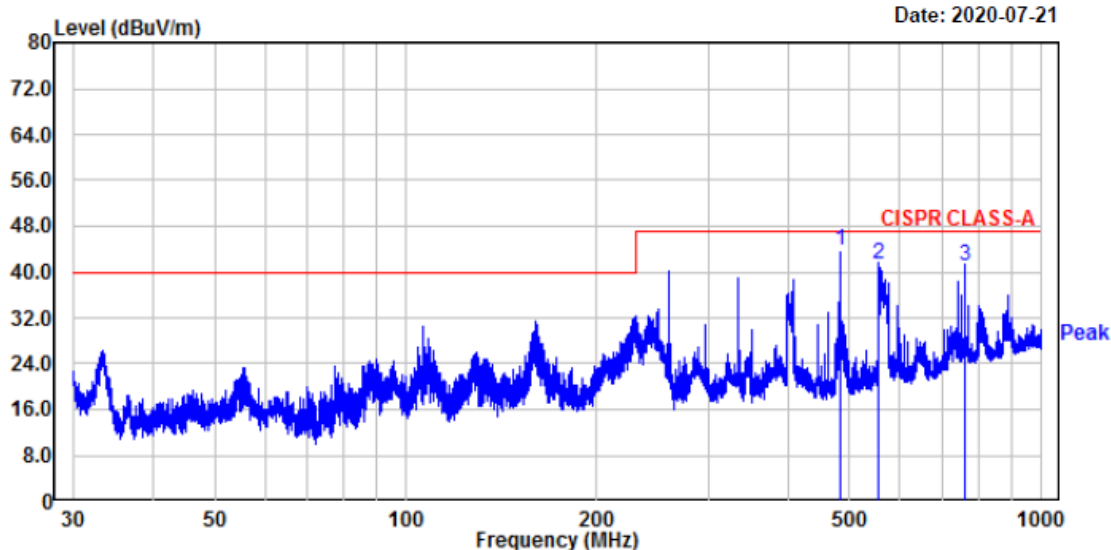
Temp/Humi: 21 'C / 54 % R.H.

Test Mode : REC mode

Tested by: PARK J H

Power : 230 V / 50 Hz

Date: 2020-07-21



No.	Freq MHz	Reading dBμV	C.F dB	Result QP dBμV/m	Limit dBμV/m	Margin dB	Height cm	Angle deg	Polarity
1.	482.64	50.85	-7.14	43.71	47.00	3.29	100	258	horizontal
2.	555.80	47.52	-6.12	41.40	47.00	5.60	358	129	horizontal
3.	758.04	42.19	-1.14	41.05	47.00	5.95	367	154	horizontal

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

Radiated Emissions

(Above 1 GHz) / V

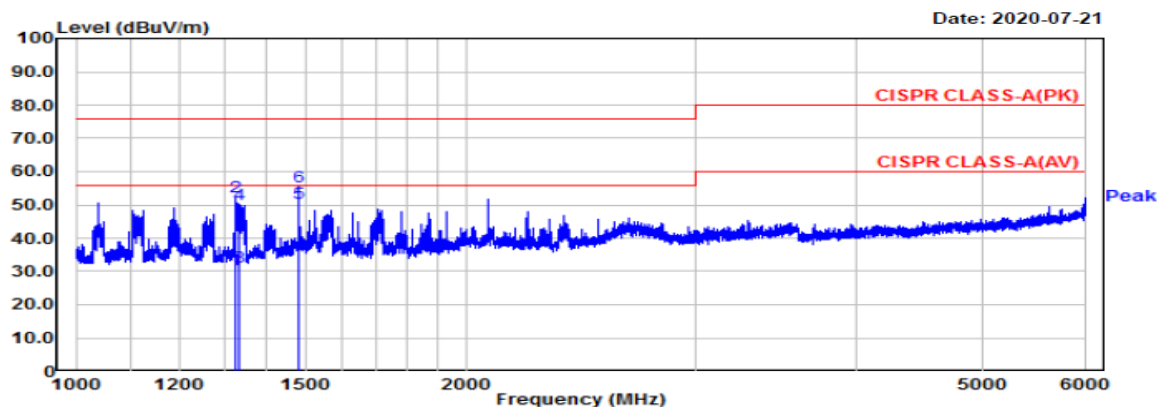
EUT/Model No.: XRP-4210B4

Temp/Humi: 21 °C / 54 % R.H.

Test Mode : REC mode

Tested by: PARK J H

Power : 230 V / 50 Hz



(Above 1 GHz) / H

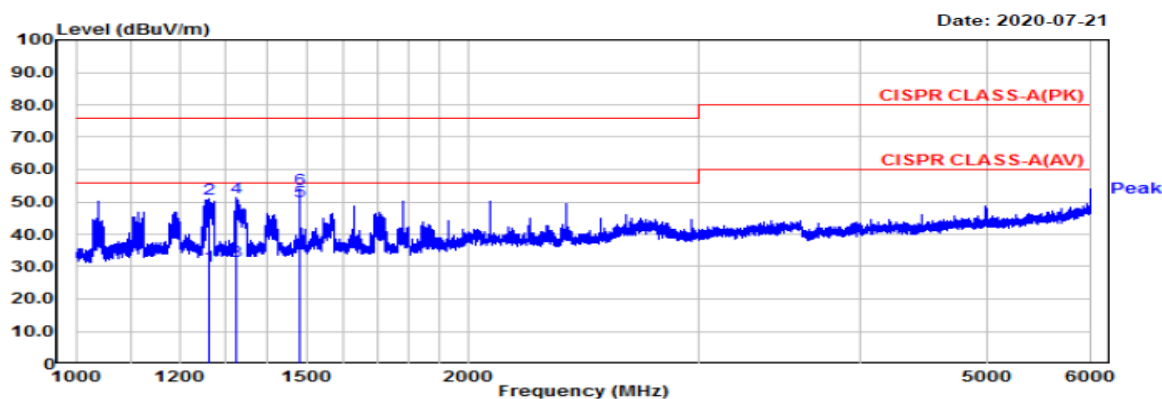
EUT/Model No.: XRP-4210B4

Temp/Humi: 21 °C / 54 % R.H.

Test Mode : REC mode

Tested by: PARK J H

Power : 230 V / 50 Hz



Manufacture : HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.

Test Date

Temp.: 21.00

Humidity : 54.00

Distance (m)

Model : XRP-4210B4

2020-07-21

21.00

54.00

3.85

TEST mode : REC mode

Frequency MHz	Reading(PK) dBuV	Reading(AV) dBuV	C.F dB	Result(PK) dBuV/m	Result(AV) dBuV/m	Limit(PK) dBuV/m	Limit(AV) dBuV/m	Margin(PK) dB	Margin(AV) dB	Height cm	Angle deg	Polarity H/V
1262.86	58.74	37.87	-5.63	53.11	32.24	76.00	56.00	22.89	23.76	100	360	H
1325.45	58.50	38.98	-5.08	53.42	33.90	76.00	56.00	22.58	22.10	100	59	H
1483.51	60.17	56.31	-4.04	56.13	52.27	76.00	56.00	19.87	3.73	100	37	H
1323.67	59.66	37.86	-5.10	54.56	32.76	76.00	56.00	21.44	23.24	100	45	V
1334.99	57.45	38.64	-4.96	52.49	33.68	76.00	56.00	23.51	22.32	100	32	V
1483.51	61.53	56.93	-4.04	57.49	52.89	76.00	56.00	18.51	3.11	100	118	V

3.2.3 Harmonic Current Emission

Definition:

This part deals with the Limitation of harmonic currents injected into the public supply system.

We were performed the test according to LTA procedure LTA-QI-04.

Test method	: EN 61000-3-2:2014
Test mode	: REC mode
Rated power	: 68.385 W
Result	: Not Applicable

Measurement Data:

- Refer to the Next page (Maximum emission configuration)

Harmonic Current Emission

22nd July 2020 - 22:38:17		Page 1/6	IECSoft v2_6
		BSEN61000-3-2:2014 Fluctuating Harmonics	
			
Instrument Details			
Instrument Model	PPA5511		
Serial Number	162-04957		
Firmware Version	2.179		
N4L Calibration Date	18th September 2017		
Instrument Version	Standard		
Test Settings			
Class	Class A		
Mode	Measured		
Equipment Under Test			
Brand	Hanwha Techwin Co., Ltd.		
Model	XRP-4210B4		
Serial	N/A		
Impedance Network ID	N/A		
Test Conditions			
	User Entered	Measured	
Rated Voltage	N/A	230.836V	
Rated Current	N/A	407.459mA	
Rated Frequency	N/A	50.000Hz	
Rated Power	N/A	68.385W	
Additional Test Information			
Measured Power Factor	0.7269		
Max Current THD	20.21%		
Average THC	77.034mA		
Max Power	79.983W		
Max F.Current	430.458mA		
Average F.Current	390.100mA		
Minimum Current	100A		
Test Duration	2.5 minutes		
Additional Test Details			
Operator	N/A		
Lab Name	N/A		
Location	N/A		
Notes			
Signature			
Results	PASS		

22nd July 2020 - 22:38:17

Ph:1 Page 2/6

IECSoft v2_6

BSEN61000-3-2:2014 Fluctuating Harmonics

Instrument Details

Instrument Model	PPA5511
Instrument Serial	162-04957
Instrument Firmware	2.179

Equipment Under Test

Brand	Hanwha Techwin Co., Ltd.
Model	XRP-4210B4
Serial	N/A

Harmonic Difference

Harmonic	Lowest		Highest		Limit	Difference (A)	Status
	Average (A)	Test #	Average (A)	Test #			
2	7.953m	2	8.502m	1	0.054	0.000549	PASS
3	57.049m	2	57.583m	1	0.115	0.000534	PASS
4	5.947m	2	6.051m	1	0.0215	0.000104	PASS
5	29.233m	2	29.418m	1	0.057	0.000185	PASS
6	5.818m	2	5.924m	1	0.015	0.000106	PASS
7	17.227m	2	17.471m	1	0.0385	0.000244	PASS
8	5.692m	2	5.728m	1	0.0115	0.000036	PASS
9	12.032m	2	12.105m	1	0.02	0.000073	PASS
10	5.517m	1	5.572m	2	0.0092	0.000056	PASS
11	9.530m	1	9.595m	2	0.0165	0.000065	PASS
12	5.444m	1	5.488m	2	0.007667	0.000044	PASS
13	8.141m	1	8.193m	2	0.0105	0.000051	PASS
14	5.367m	1	5.408m	2	0.006571	0.000041	PASS
15	7.523m	2	7.670m	1	0.0075	0.000148	PASS
16	5.357m	1	5.360m	2	0.00575	0.000003	PASS
17	7.286m	1	7.287m	2	0.006618	0.000001	PASS
18	5.300m	1	5.300m	2	0.005111	0	PASS
19	6.876m	2	6.893m	1	0.005921	0.000017	PASS
20	5.359m	2	5.391m	1	0.0046	0.000032	PASS
21	6.703m	2	6.742m	1	0.005357	0.000004	PASS
22	5.407m	2	5.464m	1	0.004182	0.000058	PASS
23	6.702m	2	6.716m	1	0.004891	0.000014	PASS
24	5.452m	2	5.452m	1	0.003833	0	PASS
25	6.524m	1	6.532m	2	0.0045	0.000009	PASS
26	5.555m	2	5.589m	1	0.003538	0.000034	PASS
27	6.391m	2	6.421m	1	0.004167	0.000003	PASS
28	5.544m	1	5.556m	2	0.003286	0.000012	PASS
29	6.243m	1	6.310m	2	0.003879	0.000067	PASS
30	5.510m	2	5.623m	1	0.003067	0.000113	PASS
31	6.352m	2	6.417m	1	0.003629	0.000065	PASS
32	5.548m	1	5.571m	2	0.002875	0.000023	PASS
33	6.294m	2	6.377m	1	0.003409	0.000083	PASS
34	5.562m	1	5.573m	2	0.002706	0.000011	PASS
35	6.283m	1	6.292m	2	0.003214	0.000009	PASS
36	5.540m	1	5.557m	2	0.002556	0.000016	PASS
37	5.975m	2	6.037m	1	0.003041	0.000062	PASS
38	5.481m	2	5.565m	1	0.002421	0.000084	PASS
39	6.007m	1	6.008m	2	0.002885	0	PASS
40	5.451m	2	5.503m	1	0.0023	0.000052	PASS

Key:

Ignored	Since both values are less than 5mA or 0.6% of the Input Current this harmonic is ignored
Good	The difference is less than 50% of the allowance
OK	The difference is between 50% of the allowance and 75% of the allowance
Poor	The difference is between 75% of the allowance and 100% of the allowance
Fail	The difference has exceeded the allowance

22nd July 2020 - 22:38:17		Ph:1 Page 3/6		IECSoft v2_6			
BSEN61000-3-2:2014 Fluctuating Harmonics							
Instrument Details							
Instrument Model	PPA5511						
Instrument Serial	162-04957						
Instrument Firmware	2.179						
Equipment Under Test							
Brand	Hanwha Techwin Co., Ltd.						
Model	XRP-4210B4						
Serial	N/A						
Extra Test Information							
Current THDG	20.00%						
	Average	Peak	Limit				
THC	77.581mA	84.926mA	N/A				
POHC	20.194mA	21.446mA	251.375mA				
Voltage Crest Factor	1.418	1.701	N/A				
Current Crest Factor	2.313	9.162	N/A				
Harmonics Results 1/2							
Harmonic	Status	Avg (A)	Avg L(A)	Avg %ofL	Peak (A)	Peak L(A)	Peak %ofL
1	PASS	0.39169	No Limit	N/A	0.43046	No Limit	N/A
2	PASS	0.0085	1.08	0.787213	0.01015	1.62	0.626358
3	PASS	0.05758	2.3	2.50361	0.06446	3.45	1.86838
4	PASS	0.00605	0.43	1.40712	0.00683	0.645	1.05853
5	PASS	0.02942	1.14	2.58053	0.03176	1.71	1.85754
6	PASS	0.00592	0.3	1.97457	0.00664	0.45	1.47609
7	PASS	0.01747	0.77	2.26896	0.02095	1.155	1.81377
8	PASS	0.00573	0.23	2.49048	0.00643	0.345	1.86438
9	PASS	0.01211	0.4	3.02625	0.01356	0.6	2.25983
10	PASS	0.00552	0.184	2.99821	0.00629	0.276	2.28076
11	PASS	0.00953	0.33	2.88779	0.01043	0.495	2.10687
12	PASS	0.00544	0.15333	3.55032	0.00631	0.23	2.74554
13	PASS	0.00814	0.21	3.87686	0.00899	0.315	2.85537
14	PASS	0.00537	0.13143	4.08316	0.00594	0.19715	3.01266
15	PASS	0.00767	0.15	5.11367	0.00843	0.225	3.74556
16	PASS	0.00536	0.115	4.65843	0.006	0.1725	3.48058
17	PASS	0.00729	0.13235	5.50502	0.00799	0.19853	4.0267
18	PASS	0.0053	0.10222	5.1846	0.00588	0.15333	3.83219
19	PASS	0.00689	0.11842	5.82047	0.00772	0.17763	4.3442
20	PASS	0.00539	0.092	5.85935	0.00596	0.138	4.31688
21	PASS	0.00674	0.10714	6.29307	0.00759	0.16071	4.71974
22	PASS	0.00546	0.08364	6.53355	0.00613	0.12545	4.88713
23	PASS	0.00672	0.09783	6.86535	0.00751	0.14674	5.11629
24	PASS	0.00545	0.07667	7.11088	0.00621	0.115	5.39598
25	PASS	0.00652	0.09	7.24844	0.00743	0.135	5.50178
26	PASS	0.00559	0.07077	7.89767	0.00615	0.10615	5.79698
27	PASS	0.00642	0.08333	7.70547	0.00716	0.125	5.72658
28	PASS	0.00554	0.06571	8.43641	0.00633	0.09857	6.41781
29	PASS	0.00624	0.07759	8.04617	0.00686	0.11638	5.89084
30	PASS	0.00562	0.06133	9.16815	0.0065	0.092	7.0683
31	PASS	0.00642	0.07258	8.84047	0.00724	0.10887	6.64747
32	PASS	0.00555	0.0575	9.64817	0.00628	0.08625	7.28058
33	PASS	0.00638	0.06818	9.35291	0.00726	0.10227	7.09904
34	PASS	0.00556	0.05412	10.2775	0.00625	0.08118	7.70206
35	PASS	0.00628	0.06429	9.77413	0.00691	0.09643	7.16403
36	PASS	0.00554	0.05111	10.8401	0.00622	0.07667	8.10967
37	PASS	0.00604	0.06081	9.92715	0.00707	0.09122	7.74564
38	PASS	0.00556	0.04842	11.4925	0.00617	0.07263	8.49466
39	PASS	0.00601	0.05769	10.4129	0.00695	0.08654	8.02815
40	PASS	0.0055	0.046	11.9628	0.00613	0.069	8.88246

22nd July 2020 - 22:38:17		Ph:1 Page 4/6		IECSoft v2_6			
BSEN61000-3-2:2014 Fluctuating Harmonics							
Instrument Details							
Instrument Model	PPA5511						
Instrument Serial	162-04957						
Instrument Firmware	2.179						
Equipment Under Test							
Brand	Hanwha Techwin Co., Ltd.						
Model	XRP-4210B4						
Serial	N/A						
Extra Test Information							
Current THDG	20.06%						
	Average	Peak	Limit				
THC	76.931mA	78.253mA	N/A				
POHC	20.127mA	20.795mA	251.375mA				
Voltage Crest Factor	1.417	1.695	N/A				
Current Crest Factor	2.74	17.672	N/A				
Harmonics Results 2/2							
Harmonic	Status	Avg (A)	Avg L(A)	Avg %ofL	Peak (A)	Peak L(A)	Peak %ofL
1	PASS	0.3885	No Limit	N/A	0.39233	No Limit	N/A
2	PASS	0.00795	1.08	0.73638	0.00912	1.62	0.562691
3	PASS	0.05705	2.3	2.48039	0.05843	3.45	1.69357
4	PASS	0.00595	0.43	1.38291	0.00668	0.645	1.03577
5	PASS	0.02923	1.14	2.5643	0.03004	1.71	1.7569
6	PASS	0.00582	0.3	1.93933	0.00637	0.45	1.41504
7	PASS	0.01723	0.77	2.23727	0.0181	1.155	1.56675
8	PASS	0.00569	0.23	2.4747	0.00639	0.345	1.85293
9	PASS	0.01203	0.4	3.008	0.01334	0.6	2.2225
10	PASS	0.00557	0.184	3.02853	0.00615	0.276	2.22779
11	PASS	0.00959	0.33	2.90755	0.0106	0.495	2.14101
12	PASS	0.00549	0.15333	3.57908	0.00631	0.23	2.74549
13	PASS	0.00819	0.21	3.90133	0.00889	0.315	2.8226
14	PASS	0.00541	0.13143	4.11474	0.00599	0.19715	3.03614
15	PASS	0.00752	0.15	5.01527	0.00835	0.225	3.71231
16	PASS	0.00536	0.115	4.66113	0.00595	0.1725	3.44887
17	PASS	0.00729	0.13235	5.50586	0.00798	0.19853	4.02085
18	PASS	0.0053	0.10222	5.1846	0.0059	0.15333	3.84765
19	PASS	0.00688	0.11842	5.80637	0.00765	0.17763	4.30541
20	PASS	0.00536	0.092	5.825	0.0061	0.138	4.42348
21	PASS	0.0067	0.10714	6.25602	0.00756	0.16071	4.70369
22	PASS	0.00541	0.08364	6.46456	0.00606	0.12545	4.82703
23	PASS	0.0067	0.09783	6.85074	0.00738	0.14674	5.02695
24	PASS	0.00545	0.07667	7.11062	0.00617	0.115	5.3645
25	PASS	0.00653	0.09	7.25811	0.0072	0.135	5.3357
26	PASS	0.00556	0.07077	7.84976	0.00624	0.10615	5.87969
27	PASS	0.00639	0.08333	7.66923	0.00709	0.125	5.67082
28	PASS	0.00556	0.06571	8.45497	0.00626	0.09857	6.3469
29	PASS	0.00631	0.07759	8.13252	0.00718	0.11638	6.16924
30	PASS	0.00551	0.06133	8.98309	0.00606	0.092	6.58547
31	PASS	0.00635	0.07258	8.75146	0.00697	0.10887	6.39975
32	PASS	0.00557	0.0575	9.68835	0.00629	0.08625	7.29055
33	PASS	0.00629	0.06818	9.23147	0.00712	0.10227	6.95716
34	PASS	0.00557	0.05412	10.2982	0.00627	0.08118	7.72682
35	PASS	0.00629	0.06429	9.78782	0.00699	0.09643	7.24377
36	PASS	0.00556	0.05111	10.872	0.00626	0.07667	8.1651
37	PASS	0.00598	0.06081	9.82602	0.00682	0.09122	7.47814
38	PASS	0.00548	0.04842	11.3193	0.0062	0.07263	8.53955
39	PASS	0.00601	0.05769	10.4137	0.00667	0.08654	7.70725
40	PASS	0.00545	0.046	11.8507	0.00624	0.069	9.04507

22nd July 2020 - 22:38:17		Ph:1 Page 5/6		IECSoft v2_6
BSEN61000-3-2:2014 Fluctuating Harmonics				
Instrument Details				
Instrument Model	PPA5511			
Instrument Serial	162-04957			
Instrument Firmware	2179			
Equipment Under Test				
Brand	Hanwha Techwin Co., Ltd.			
Model	XRP-4210B4			
Serial	N/A			
Extra Test Information				
Voltage THDS	0.09%			
Source Results 1/2				
Harmonic	Status	Peak (V)	Average (V)	Limit (V)
1	PASS	230.82	230.8	No Limit
2	PASS	0.13461	0.12626	0.461675
3	PASS	0.049224	0.042553	2.077535
4	PASS	0.030451	0.024426	0.461675
5	PASS	0.030279	0.024865	0.923349
6	PASS	0.027657	0.02291	0.461675
7	PASS	0.027352	0.022635	0.692512
8	PASS	0.029038	0.02285	0.461675
9	PASS	0.028102	0.023156	0.461675
10	PASS	0.028119	0.02254	0.461675
11	PASS	0.028282	0.022965	0.230837
12	PASS	0.029797	0.022993	0.230837
13	PASS	0.028118	0.022817	0.230837
14	PASS	0.028159	0.022689	0.230837
15	PASS	0.028947	0.024152	0.230837
16	PASS	0.027871	0.02309	0.230837
17	PASS	0.029507	0.023489	0.230837
18	PASS	0.029595	0.02261	0.230837
19	PASS	0.031327	0.02469	0.230837
20	PASS	0.028083	0.022798	0.230837
21	PASS	0.027249	0.022411	0.230837
22	PASS	0.026692	0.022266	0.230837
23	PASS	0.029426	0.024696	0.230837
24	PASS	0.02868	0.02277	0.230837
25	PASS	0.027409	0.022785	0.230837
26	PASS	0.029286	0.023228	0.230837
27	PASS	0.028402	0.022782	0.230837
28	PASS	0.027805	0.022531	0.230837
29	PASS	0.027569	0.02368	0.230837
30	PASS	0.028015	0.022696	0.230837
31	PASS	0.02902	0.023737	0.230837
32	PASS	0.028431	0.02246	0.230837
33	PASS	0.028786	0.023148	0.230837
34	PASS	0.028845	0.022583	0.230837
35	PASS	0.027407	0.022664	0.230837
36	PASS	0.027258	0.022999	0.230837
37	PASS	0.030666	0.023638	0.230837
38	PASS	0.028524	0.02312	0.230837
39	PASS	0.027256	0.02241	0.230837
40	PASS	0.029758	0.022739	0.230837

22nd July 2020 - 22:38:17		Ph:1 Page 6/6		IECSoft v2_6	
BSEN61000-3-2:2014 Fluctuating Harmonics					
Instrument Details					
Instrument Model		PPA5511			
Instrument Serial		162-04957			
Instrument Firmware		2.179			
Equipment Under Test					
Brand		Hanwha Techwin Co., Ltd.			
Model		XRP-4210B4			
Serial		N/A			
Extra Test Information					
Voltage THDS		0.09%			
Source Results 2/2					
Harmonic	Status	Peak (V)	Average (V)	Limit (V)	
1	PASS	230.81	230.8	No Limit	
2	PASS	0.13408	0.12665	0.461671	
3	PASS	0.051408	0.043728	2.077521	
4	PASS	0.030413	0.024474	0.461671	
5	PASS	0.03198	0.024625	0.923343	
6	PASS	0.02805	0.023284	0.461671	
7	PASS	0.02874	0.022833	0.692507	
8	PASS	0.02796	0.023011	0.461671	
9	PASS	0.028631	0.022523	0.461671	
10	PASS	0.027832	0.02238	0.461671	
11	PASS	0.026851	0.022777	0.230836	
12	PASS	0.028231	0.023099	0.230836	
13	PASS	0.029974	0.022758	0.230836	
14	PASS	0.030644	0.0227	0.230836	
15	PASS	0.030008	0.024275	0.230836	
16	PASS	0.028796	0.023259	0.230836	
17	PASS	0.0314	0.024117	0.230836	
18	PASS	0.027601	0.022648	0.230836	
19	PASS	0.030529	0.024868	0.230836	
20	PASS	0.028383	0.022545	0.230836	
21	PASS	0.028502	0.022563	0.230836	
22	PASS	0.028609	0.022806	0.230836	
23	PASS	0.031053	0.025146	0.230836	
24	PASS	0.026633	0.022729	0.230836	
25	PASS	0.028548	0.022867	0.230836	
26	PASS	0.028314	0.023394	0.230836	
27	PASS	0.029336	0.023309	0.230836	
28	PASS	0.027974	0.02316	0.230836	
29	PASS	0.027617	0.023203	0.230836	
30	PASS	0.026875	0.022856	0.230836	
31	PASS	0.028997	0.023736	0.230836	
32	PASS	0.027269	0.022795	0.230836	
33	PASS	0.027583	0.022903	0.230836	
34	PASS	0.027055	0.02259	0.230836	
35	PASS	0.028553	0.022406	0.230836	
36	PASS	0.027892	0.022784	0.230836	
37	PASS	0.029212	0.023504	0.230836	
38	PASS	0.029525	0.023062	0.230836	
39	PASS	0.027735	0.022736	0.230836	
40	PASS	0.027664	0.022884	0.230836	

3.2.4 Voltage Fluctuations and Flicker

Definition:

This section is concerned with the limitation of voltage fluctuations and flicker impressed on the public low-voltage system.

We were performed the test according to LTA procedure LTA-QI-04.

Test method : EN 61000-3-3:2013

Test mode : REC mode

Result : **Complies**

Measurement Data:

- Refer to the Next page

Voltage Fluctuations and Flicker

22nd July 2020 - 22:46:13		Page 1/2	IECSoft v2.6
		IEC61000-3-3:2013 Ed.3.0 Flickermeter	
			
Instrument Details			
Instrument Model	PPA5511		
Serial Number	162-04957		
Firmware Version	2.179		
N4L Calibration Date	18th September 2017		
Instrument Version	Standard		
Test Settings			
Class	Voltage		
Mode	Normal (4.0%)		
Minimum Current	10A		
PST	10 minutes		
PLT	12 PSTs		
Equipment Under Test			
Brand	Hanwha Techwin Co., Ltd.		
Model	XRP-4210B4		
Serial	N/A		
Impedance Network ID	N/A		
Test Conditions			
	User Entered	Measured	
Rated Voltage	N/A	230.869V	
Rated Current	N/A	N/A	
Rated Frequency	N/A	50.000Hz	
Rated Power	N/A	N/A	
D max	0.1024% (Limit: 4.0%)		
T max	0.0000 s (Limit: 0.5 s)		
DC max	0.0042% (Limit: 3.3%)		
Additional Test Details			
Operator	N/A		
Lab Name	N/A		
Location	N/A		
Notes			
Signature			
Results	Phase1: PASS		

22nd July 2020 - 22:46:13		Ph:1 Page 2/2		IECSoft v2_6				
IEC61000-3-3:2013 Ed.3.0 Flickermeter								
Instrument Details								
Instrument Model		PPA5511						
Instrument Serial		162-04957						
Instrument Firmware		2.179						
Equipment Under Test								
Brand		Hanwha Techwin Co., Ltd.						
Model		XRP-4210B4						
Serial		N/A						
Flicker Test Results								
PST no.	Status	DC (%)	Dmax (%)	Tmax (s)	PST	PST Lim	PLT	PLT Lim
1	Phase 1: PASS	0.00418	0.06696	0.00000	0.08226	1.00000	0.08226	N/A
2	Phase 1: PASS	0.00418	0.07176	0.00000	0.08226	1.00000	0.08226	N/A
3	Phase 1: PASS	0.00418	0.07976	0.00000	0.08226	1.00000	0.08226	N/A
4	Phase 1: PASS	0.00418	0.10237	0.00000	0.08226	1.00000	0.08226	N/A
5	Phase 1: PASS	0.00418	0.10237	0.00000	0.08226	1.00000	0.08226	N/A
6	Phase 1: PASS	0.00418	0.10237	0.00000	0.08226	1.00000	0.08226	N/A
7	Phase 1: PASS	0.00418	0.10237	0.00000	0.08226	1.00000	0.08226	N/A
8	Phase 1: PASS	0.00418	0.10237	0.00000	0.08226	1.00000	0.08226	N/A
9	Phase 1: PASS	0.00418	0.10237	0.00000	0.08226	1.00000	0.08226	N/A
10	Phase 1: PASS	0.00418	0.10237	0.00000	0.08226	1.00000	0.08226	N/A
11	Phase 1: PASS	0.00418	0.10237	0.00000	0.08226	1.00000	0.08226	N/A
12	Phase 1: PASS	0.00418	0.10237	0.00000	0.08226	1.00000	0.08226	0.65000

3.3 IMMUNITY

3.3.1 Electrostatic Discharge

Definition:

The test assesses the ability of the EUT to operate as intended in the event of an electrostatic discharge.

We were performed the test according to LTA procedure LTA-QI-04.

Test date	: 2020. 07. 24.
Test method	: EN 61000-4-2 :2009
Temperature / Humidity / Pressure	: 25 °C / 50 % R.H. / 100.2 kPa
Discharge Impedance	: $(330 \pm 10 \%) \Omega$ / $(150 \pm 10 \%) \text{ pF}$
Type of Discharge (air discharge)	: $\pm 2 \text{ kV}$, $\pm 4 \text{ kV}$, $\pm 8 \text{ kV}$
Type of Discharge (contact discharge)	: $\pm 6 \text{ kV}$
Number of discharges at each point	: 10 of each polarity
Discharge Repetition on Rate	: 1 / sec
Test mode	: REC mode
Result	: Complies

Measurement Data:
1-1. Indirect Discharge

No.	Position	Kind of Discharge	Results	Remarks
1	HCP	Contact	Complies	No reaction recognized
2	VCP	Contact	Complies	No reaction recognized

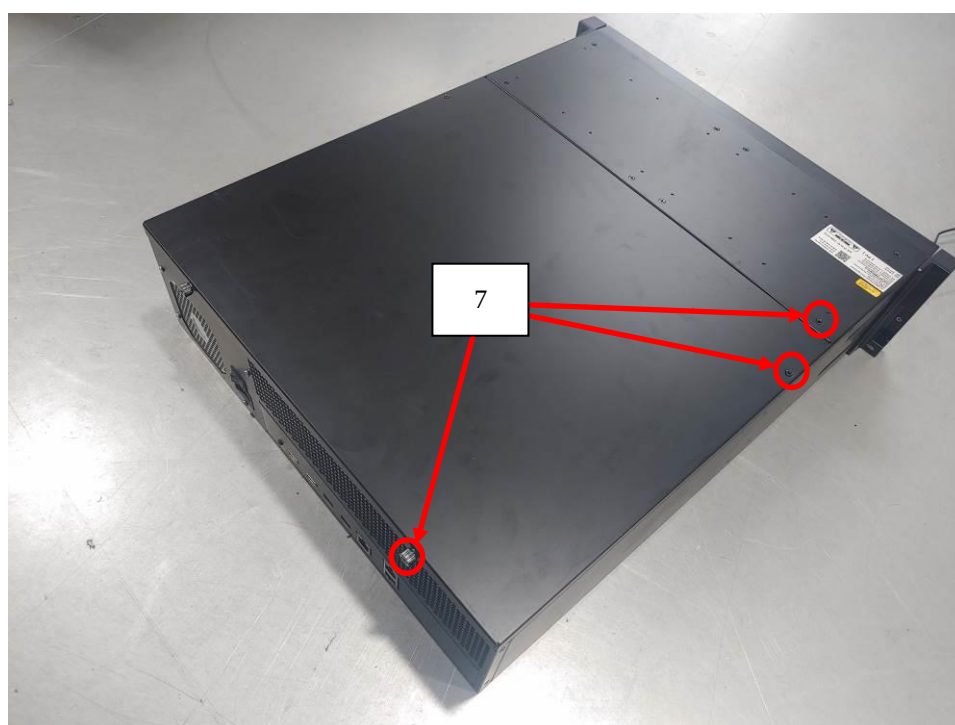
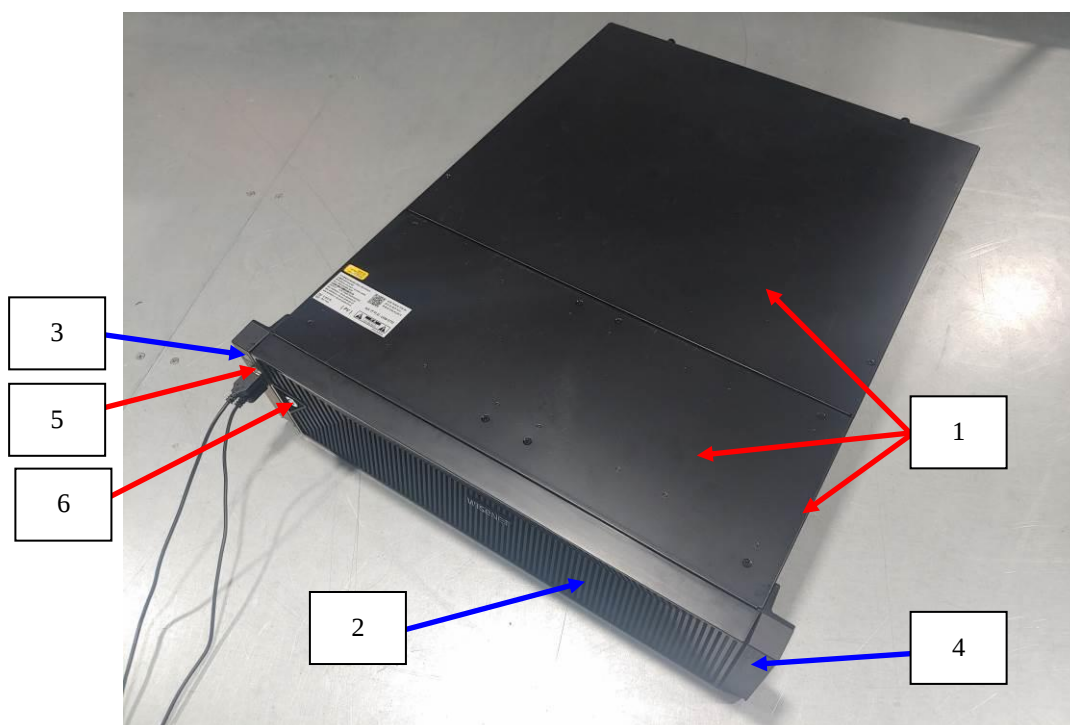
1-2. Direct Discharge

No.	Position	Kind of Discharge	Result	Remarks
1	Enclosure #1	Contact	Complies	No reaction recognized
2	Enclosure #2	Air	Complies	No reaction recognized
3	Button	Air	Complies	No reaction recognized
4	LED	Air	Complies	No reaction recognized
5	USB 2.0	Contact	Complies	No reaction recognized
6	Key Hole	Contact	Complies	No reaction recognized
7	Screw	Contact	Complies	No reaction recognized
8	LAN	Contact	Complies	No reaction recognized
9	Power Switch	Air	Complies	No reaction recognized
10	AC IN	Air	Complies	No reaction recognized
11	AUDIO OUT	Air	Complies	No reaction recognized
12	HDMI	Contact	Complies	No reaction recognized
13	USB 3.0 #1	Contact	Complies	No reaction recognized
14	USB 3.0 #2	Air	Complies	No reaction recognized

ESD TEST POINT

[Air discharge]

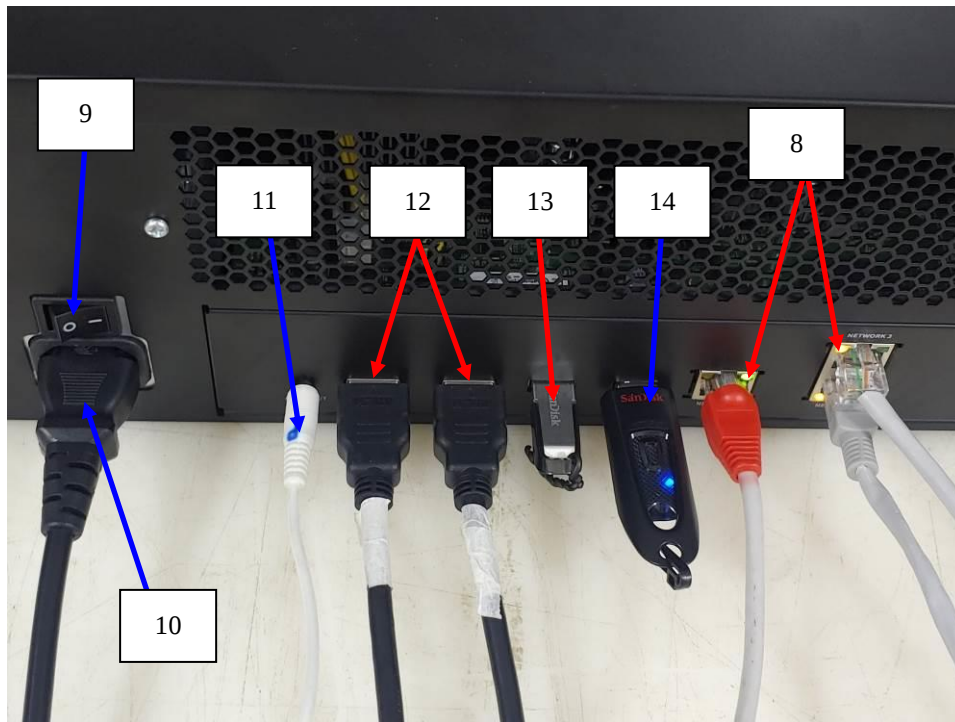
[Contact discharge]



ESD TEST POINT

[Air discharge]

[Contact discharge]



3.3.2 RF Electromagnetic Field

Definition:

The test assesses the ability of the EUT to operate as intended in the presence of a radio frequency electromagnetic field disturbance.

We were performed the test according to LTA procedure LTA-QI-04.

Test date	:	2020. 07. 28.
Test method	:	EN 61000-4-3:2006/A1:2008/A2:2010
Temperature / Humidity / Pressure	:	25 °C / 52 % R.H. / 100.3 kPa
Frequency range	:	80 MHz to 2,700 MHz
Test level	:	10 V/m (measured unmodulated)
Amplitude Modulation	:	AM, 80 %, 1 kHz Sinusoidal PM, 1 Hz (0.5s ON : 0.5s OFF)
Step size	:	1 % of fundamental
Dwell Time	:	3 s
Test mode	:	REC mode
Result	:	Complies

Measurement Data:

Port	Side	Result	Remarks
Horizontal	Front	Complies	No reaction recognized
	Left	Complies	No reaction recognized
	Rear	Complies	No reaction recognized
	Right	Complies	No reaction recognized
Vertical	Front	Complies	No reaction recognized
	Left	Complies	No reaction recognized
	Rear	Complies	No reaction recognized
	Right	Complies	No reaction recognized

3.3.3 Electrical Fast Transients

Definition:

The test assesses the ability of the EUT to operate as intended in the event of fast transients presence on one of the input/output ports.

We were performed the test according to LTA procedure LTA-QI-04.

Test date	:	2020. 07. 23.
Test method	:	EN 61000-4-4:2012
Temperature / Humidity / Pressure	:	25 °C / 49 % R.H. / 100.1 kPa
Cable length	:	> 3 m
Test level	:	2.0 kV (AC power input port) 1.0 kV (Signal port)
Polarity	:	Negative/ positive
Repetition frequency	:	100 kHz
Test mode	:	REC mode
Result	:	Complies

Measurement Data:

Power Line	Test level	Result	Remarks
L – N – PE	±2 kV	Complies	No reaction recognized

Signal Line	Test level	Result	Remarks
LAN #1	±1 kV	Complies	No reaction recognized
LAN #2	±1 kV	Complies	No reaction recognized
LAN #3	±1 kV	Complies	No reaction recognized

3.3.4 Surges

Definition:

The test assesses the ability of the EUT to operate as intended in the event of surge presence on the AC main power input ports.

We were performed the test according to LTA procedure LTA-QI-04.

Test date	:	2020. 07. 23.
Test method	:	EN 61000-4-5:2014/A1:2017
Temperature / Humidity / Pressure	:	25 °C / 50 % R.H. / 100.1 kPa
Test level	:	±0.5 kV, ±1 kV (line to line) ±0.5 kV, ±1 kV, ±2 kV (line to ground), ±0.5 kV, ±1 kV (signal line)
Polarity	:	Negative/ positive
Wave shape	:	1.2/ 50 µs pulse
Number of surges	:	5 (at each phase)
Test mode	:	REC mode
Result	:	Complies

Measurement Data:

Phase	Line	level	Result	Remark
0°	Line(L) to Line(N)	±(0.5, 1.0) kV	Complies	No reaction recognized
	Line(L) to ground(PE)	±(0.5, 1.0, 2.0) kV	Complies	No reaction recognized
	Line(N) to ground(PE)	±(0.5, 1.0, 2.0) kV	Complies	No reaction recognized
90°	Line(L) to Line(N)	±(0.5, 1.0) kV	Complies	No reaction recognized
	Line(L) to ground(PE)	±(0.5, 1.0, 2.0) kV	Complies	No reaction recognized
	Line(N) to ground(PE)	±(0.5, 1.0, 2.0) kV	Complies	No reaction recognized
180°	Line(L) to Line(N)	±(0.5, 1.0) kV	Complies	No reaction recognized
	Line(L) to ground(PE)	±(0.5, 1.0, 2.0) kV	Complies	No reaction recognized
	Line(N) to ground(PE)	±(0.5, 1.0, 2.0) kV	Complies	No reaction recognized
270°	Line(L) to Line(N)	±(0.5, 1.0) kV	Complies	No reaction recognized
	Line(L) to ground(PE)	±(0.5, 1.0, 2.0) kV	Complies	No reaction recognized
	Line(N) to ground(PE)	±(0.5, 1.0, 2.0) kV	Complies	No reaction recognized

Signal Line	level	Result	Remark
LAN #1	±(0.5, 1.0) kV	Complies	No reaction recognized
LAN #2	±(0.5, 1.0) kV	Complies	No reaction recognized
LAN #3	±(0.5, 1.0) kV	Complies	No reaction recognized

3.3.5 Conducted Disturbances, Induced by Radio-Frequency Fields

Definition:

The test assesses the ability of the EUT to operate as intended in the presence of a radio frequency electromagnetic disturbance on the input/output ports.

We were performed the test according to LTA procedure LTA-QI-04.

Test date	:	2020. 07. 24.
Test method	:	EN 61000-4-6:2014/AC:2015
Temperature / Humidity / Pressure	:	23 °C / 50 % R.H. / 100.2 kPa
Frequency range	:	0.15 MHz – 100 MHz
Test level	:	10 Vrms unmodulated
Amplitude Modulation	:	AM, 80 %, 1 kHz Sinusoidal PM, 1 Hz (0.5s ON : 0.5s OFF)
Step size	:	1 % of fundamental.
Test mode	:	REC mode
Result	:	Complies

Measurement Data:

Power Port	Result	Remarks
Power	Complies	No reaction recognized

Signal Port	Result	Remarks
LAN #1	Complies	No reaction recognized
LAN #2	Complies	No reaction recognized
LAN #3	Complies	No reaction recognized

3.3.6 Voltage dips and Interruptions

Definition:

The test assesses the ability of the EUT to operate as intended in the event of voltage dips and interruptions present on the AC mains power input ports.

We were performed the test according to LTA procedure LTA-QI-04.

Test date	:	2020. 07. 23.
Test method	:	EN 61000-4-11:2004/A1:2017
Temperature / Humidity / Pressure	:	25 °C / 51 % R.H. / 100.1 kPa
Ut	:	230 Vac
Test mode	:	REC mode
Result	:	Complies

Measurement Data:

Test Level %Ut	Voltage droop and interruptions %Ut	Duration of Reduction (period)	Result	Remarks
80	20	250	Complies (A)	No reaction recognized
70	30	25	Complies (A)	No reaction recognized
40	60	10	Complies (A)	No reaction recognized
0	100	250	Complies (C)	EUT was turned off during the test. Re-operated about user's control. After the test, EUT was operated normally.

3.3.7 Mains supply voltage variations

Definition:

The test assesses the ability of the EUT to operate as intended in the event of voltage variations present on the AC mains power input ports.

We were performed the test according to LTA procedure LTA-QI-04.

Test date	:	2020. 07. 23.
Test method	:	EN 61000-4-11:2004/A1:2017
Temperature / Humidity / Pressure	:	25 °C / 51 % R.H. / 100.1 kPa
Supply Voltage maximum	:	$U_{nom} + 10 \%$
Supply Voltage minimum	:	$U_{nom} - 15 \%$
U_t	:	230 Vac
Test mode	:	REC mode
Result	:	Complies

Measurement Data:

U_{nom} = Nominal mains voltage. Where provision is made to adapt the equipment to suit a number of nominal supply voltages (e.g. by transformer tap changing), the above conditioning severity shall be applied for each nominal voltage, with the equipment suitably adapted. For equipment which is claimed to be suitable for a range of nominal mains voltages (e.g. 220/240 V) without adaptation, $U_{max} = (\text{Maximum } U_{nom}) + 10 \%$, and $U_{min} = (\text{Minimum } U_{nom}) - 15 \%$. In any case the range of U_{nom} must include the European nominal mains voltage of 230 V.

2 Mains supply voltage variations

Test LevelCondition		Test Level (V)	Result	Remarks
U_{nom}	+10%	253	Complies	No reaction recognized
U_{nom}	-15%	195.5	Complies	No reaction recognized

APPENDIX A

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment are identified by the Test Laboratory.

Conducted Emissions

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	EMI TEST Receiver	ESR	Rohde & Schwarz	101499	2021.07.02	1 year
☒	Pulse Limiter	ESH3-Z2	Rohde & Schwarz	100710	2021.03.16	1 year
☐	ISN	ISN T800	TESEQ	27109	2020.09.09	1 year
☒	ISN	ENY81-CA6	Rohde & Schwarz	101565	2020.09.09	1 year
☐	ISN	ISN S8	Schwarzbeck	79	2020.09.06	1 year
☐	CURRENT PROBE	EZ-17	Rohde & Schwarz	100508	2020.09.09	1 year
☐	CDN	TSCDN-C1-BNC-75	F.C.C	07004	2021.03.16	1 year
☐	LISN	ESH3-Z6	Rohde & Schwarz	100378	2020.09.05	1 year
☐	LISN	ESH3-Z6	Rohde & Schwarz	101468	2020.09.05	1 year
☒	LISN(main)	ENV216	Rohde & Schwarz	101222	2020.09.06	1 year
☒	LISN(sub)	LT32C/10	AFJ	32031518210	2020.09.05	1 year
☒	TEST PROGRAM	e3_ce 20181212a (V9)	AUDIX	-	-	-

Radiated Emissions – Below 1 GHz

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	EMI TEST Receiver	ESU	Rohde & Schwarz	100092	2020.09.05	1 year
☒	Amplifier (25 dB)	8447D	HP	2944A07684	2021.03.16	1 year
☒	BILOG Antenna	VULB 9168	SCHWARZBECK	775	2021.03.26 (KOLAS)	2 year
☒	TEST PROGRAM	e3 20181212a (V9)	AUDIX	-	-	-

Radiated Emissions – Above 1 GHz

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	EMI TEST Receiver	ESU	Rohde & Schwarz	100092	2020.09.05	1 year
☒	Amplifier	8449B	Agilent	3008A02126	2021.03.17	1 year
☐	Amplifier	PAM-840A	COM-POWER	461314	2021.03.16	1 year
☐	HORN ANTENNA	3116B	ETS	133350	2022.05.12	2 year
☐	HORN ANTENNA	3116B	ETS	81109	2022.05.12	2 year
☒	HORN ANTENNA	3115	ETS	114105	2021.09.17 (KOLAS)	2 year
☒	TEST PROGRAM	e3 20181212a (V9)	AUDIX	-	-	-

Harmonic Current Emission / Voltage Fluctuations and Flicker

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Precision Power Analyzer	PPA5511	Newtons4th Ltd	162-04957	2020.09.16	1 year
☒	Reference Impedance Network	ES4152	NF Corp.	9074424	2020.09.09	1 year

Electrostatic Discharge

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	ESD Simulator	ESS-2000	NOISEKEN	8000C03241	2020.09.09	1 year
☒	ESD GUN	TC-815R	NOISEKEN	ESS0382069	2020.09.09	1 year

RF Electromagnetic Field

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Signal Generator	E4432B	Agilent	MY41310632	2021.03.16	1 year
☒	Power Meter	E4419B	Agilent	GB38410133	2021.03.16	1 year
☒	Power Sensor	E9300A	Agilent	MY41497992	2021.03.16	1 year
☒	Power Sensor	E9300A	Agilent	MY41497618	2021.03.16	1 year
☒	RF POWER AMPLIFIER	ITA0300KL-300	INFINITECH	0300KL 1507 001	-	-
☒	RF POWER AMPLIFIER	ITA2000KL-120	INFINITECH	200KL 1507 001	-	-
☒	RF POWER AMPLIFIER	ITA4500KL-70	INFINITECH	4500KL 1507 001	-	-
☒	RF POWER AMPLIFIER	ITA0750KL-300	INFINITECH	0750KL 1507 001	-	-
☒	Log.-Per.Antenna (80 MHz ~ 3 GHz)	K9128	RAPA	NONE	-	-
☐	Signal Generator	E4438C	Agilent	MY42080843	2020.09.06	1 year
☐	HORN ANTENNA	BBHA 9120 A	SCHWARZBECK	BBHA 9120 A 481	-	-
☐	Sound Acoustic Tester	TST-1000	TESTEK	150065-A	2020.09.09	1 year
☐	Microphone	MP201	BSWA	530147	2020.10.20	1 year

Electrical Fast Transients

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Compact Generator	Compact NX	EMTEST	P1725200196	2020.10.31	1 year
☒	AC Power Source	Variac NX	EMTEST	P1745207276	2020.10.31	1 year
☒	Capacitive Coupling Clamp	CCI	EMTEST	P1744207071	2020.10.31	1 year

Surges

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Compact Generator	Compact NX	EMTEST	P1725200196	2020.10.31	1 year
☒	AC Power Source	Variac NX	EMTEST	P1745207276	2020.10.31	1 year
☐	CDN	CNV 508T5	EMTEST	P1742204978	2020.10.31	1 year
☒	CDN	CNV 508N1	EMTEST	P1742204940	2020.10.31	

Conducted Disturbances, Induced by Radio-Frequency Fields

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Signal generator	SML03	R&S	103026/0013	2021.03.16	1 year
☒	POWER METER	NRVD	R&S	101689	2021.03.16	1 year
☒	POWER Sensor	URV5-Z2	R&S	100755	2021.03.16	1 year
☒	POWER Sensor	URV5-Z2	R&S	100756	2021.03.16	1 year
☒	RF Power Amplifier	FLL75A	FRANKONIA	1033	-	-
☒	EM INJECTION CLAMP	TSIC-23	F.C.C	529	2021.03.17	1 year
☐	CDN (M1)	TSCDN-M1-16A	F.C.C	07004	2020.09.06	1 year
☒	CDN (M2)	TSCDN-M2-16A	F.C.C	07008	2020.09.06	1 year
☐	CDN (M2)	TSCDN-M2-16A	F.C.C	07009	2021.03.16	1 year
☒	CDN (M3)	TSCDN-M3-16A	F.C.C	07016	2021.03.16	1 year
☒	CDN (M3)	TSCDN-M3-16A	F.C.C	07017	2020.09.06	1 year
☐	Sound Acoustic Tester	TST-1000	TESTEK	150065-A	2020.09.09	1 year
☐	Microphone	MP201	BSWA	530147	2020.10.20	1 year

Voltage dips and Interruptions

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Compact Generator	Compact NX	EMTEST	P1725200196	2020.10.31	1 year
☒	AC Power Source	Variac NX	EMTEST	P1745207276	2020.10.31	1 year

Mains supply voltage variations

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Compact Generator	Compact NX	EMTEST	P1725200196	2020.10.31	1 year
☒	AC Power Source	Variac NX	EMTEST	P1745207276	2020.10.31	1 year

APPENDIX B

PERFORMANCE CRITERIA

Performance criteria

The variety and the diversity of the apparatus within the scope of this document makes it difficult to define precise criteria for the evaluation of the immunity test results.

If as a result of the application of the tests defined in this standard, the apparatus becomes dangerous or unsafe then the apparatus shall be deemed to have failed the test.

A functional description and a definition of performance by the manufacture and noted in the test report, based on the following criteria:

Electrostatic discharge

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of discharge 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. The EUT shall meet the acceptance criteria for the functional test (see Clause 6), after the conditioning.

Radiated electromagnetic fields

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 such flickering of indicators occurs at a field strength of 3 V/m.

For components of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at 10 V/m, providing.

(a) there is no permanent damage or change to the EUT

(e.g. no corruption of memory or changes to programmable setting etc.)

(b) at 3 V/m, any deterioration of the picture is so minor that the system could still be used; and

(c) there is no observable deterioration of the picture at 1 V/m.

The EUT shall meet the acceptance criteria for the functional test(see Clause 6), after the conditioning.

Fast transient burst / slow high energy voltage surge

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of the bursts 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. The EUT shall meet the acceptance criteria for the functional test (see Clause 6), after the conditioning.

Slow high energy voltage surge

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the application of the surges 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. The EUT shall meet the acceptance criteria for the functional test (see Clause 6), after the conditioning.

Conducted RF immunity

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 such flickering of indicators occurs at $U_0 = 130 \text{ dB}\mu\text{V}$.

For components of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at $U_0 = 140 \text{ dB}\mu\text{V}$, providing

(a) there is no permanent damage or change to the EUT

(e.g. no corruption of memory or changes to programmable settings, etc.)

(b) at $U_0 = 130 \text{ dB}\mu\text{V}$, any deterioration of the picture is so minor that the system could still be used, and

(c) there is no observable deterioration of the picture at $U_0 = 120 \text{ dB}\mu\text{V}$.

The EUT shall meet the acceptance criteria for the functional test(see Clause 6), after the conditioning.

Voltage dip/interruption

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. The EUT shall meet the acceptance criteria for the functional test(see Clause 6), after the conditioning.

It is permitted to use ancillary equipment (e.g. A UPS) to meet the requirements of this clause. This shall be detailed in the test report and the manufacturer's installation manual.

Signaling a mains fault during the 100 % voltage reduction test is permitted.

Mains supply voltage variations

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), during the conditioning.

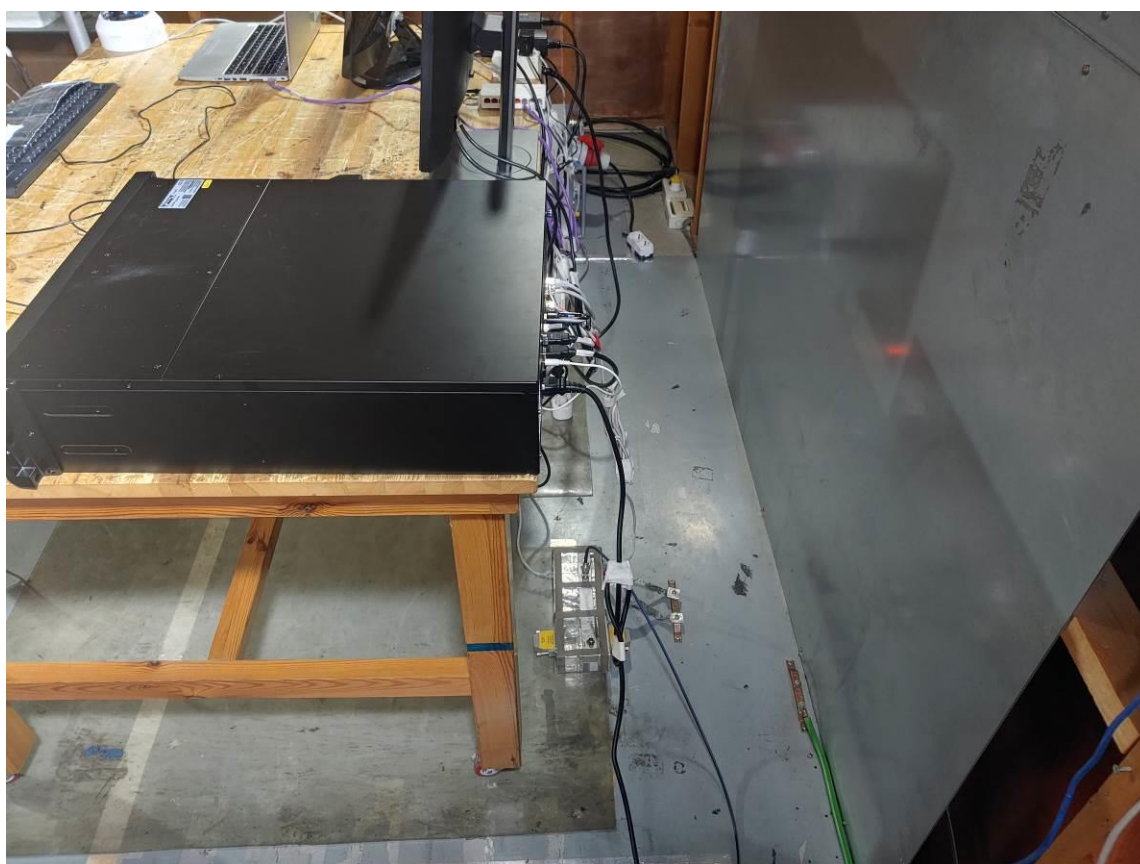
APPENDIX C

PHOTOGRAPHS

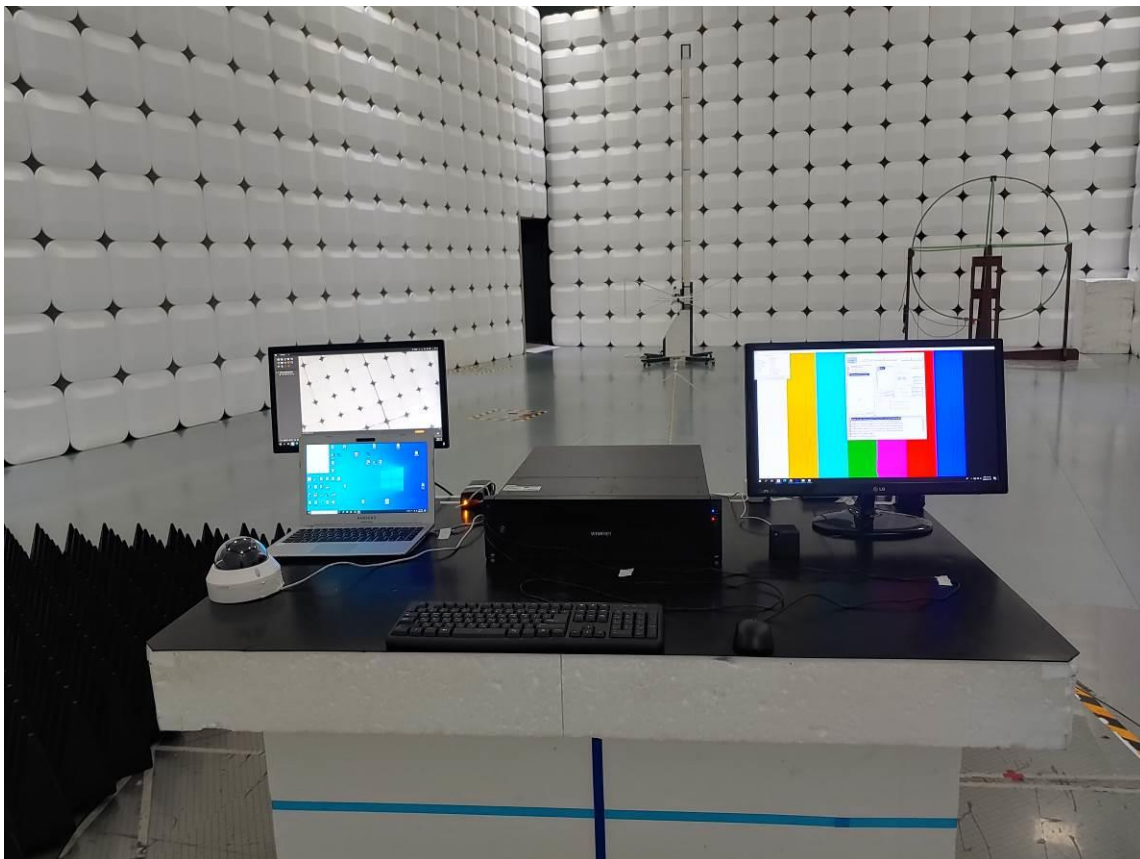
Conducted Emissions



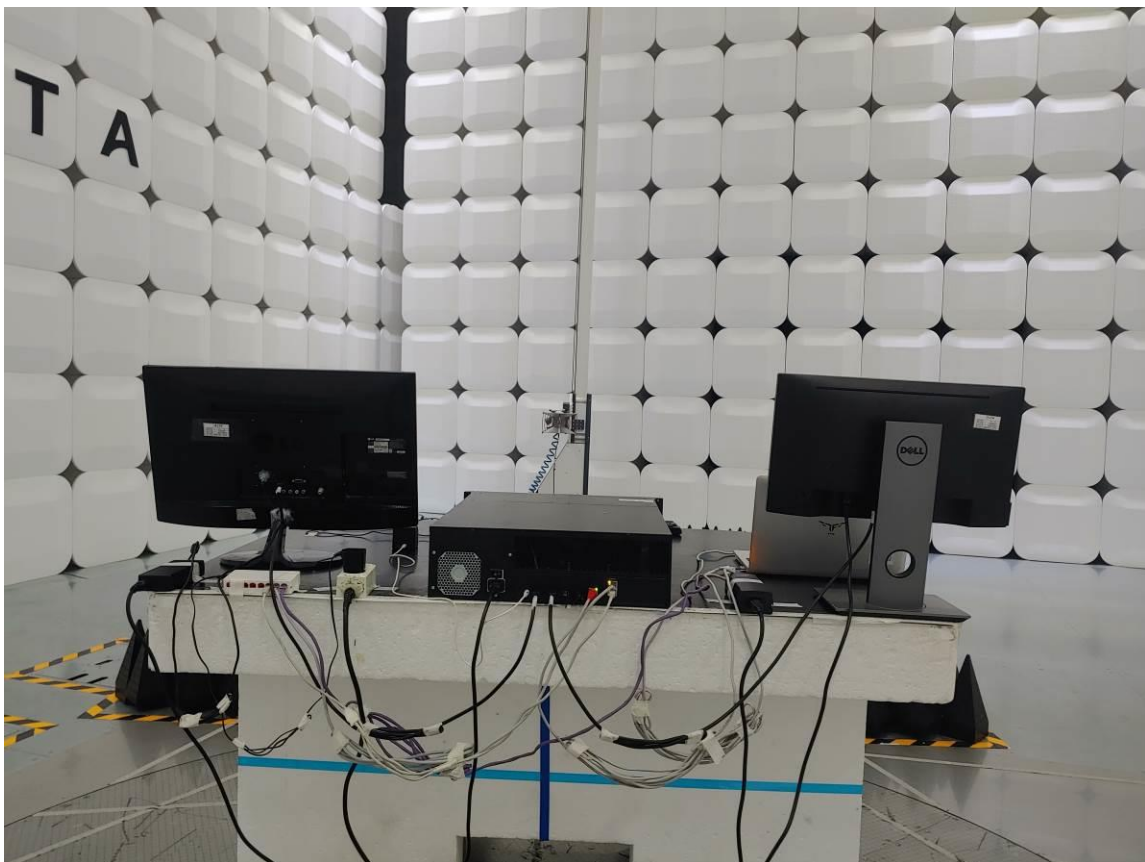
Conducted Emissions (TEL)



Radiated Emissions - Below 1 GHz



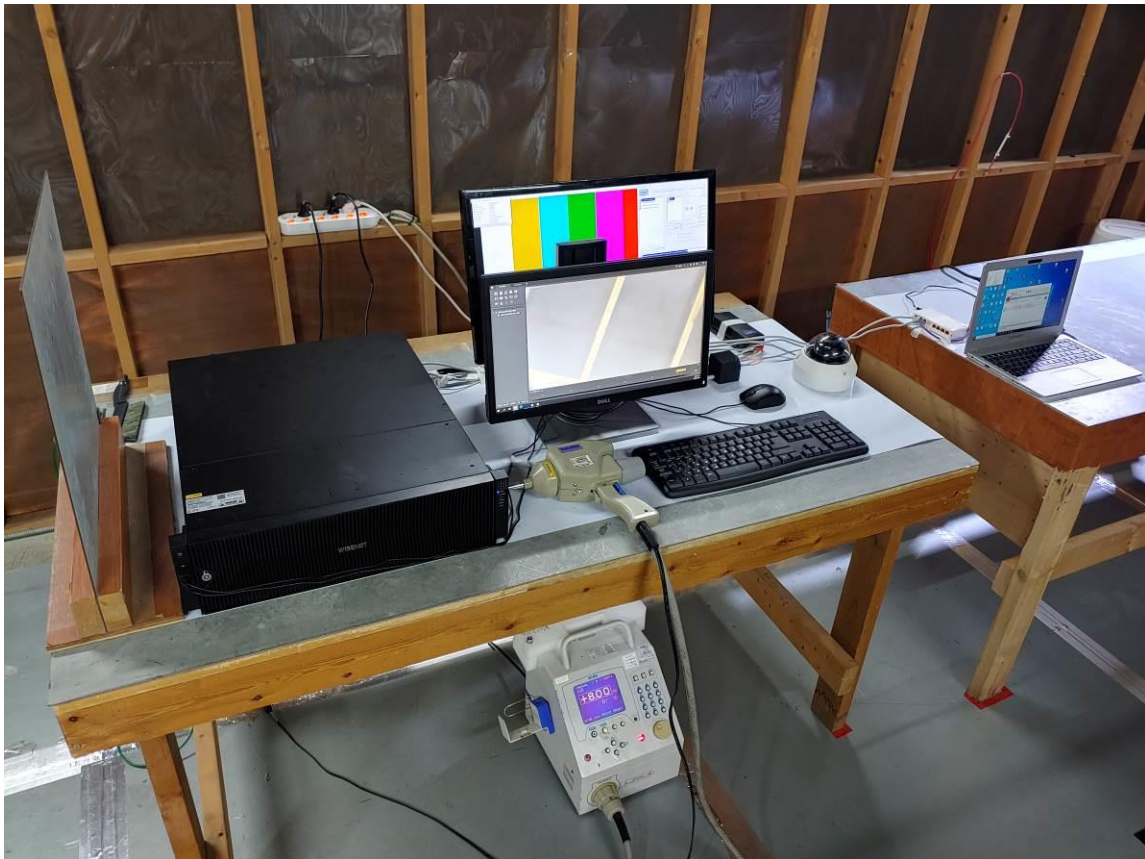
Radiated Emissions - Above 1GHz



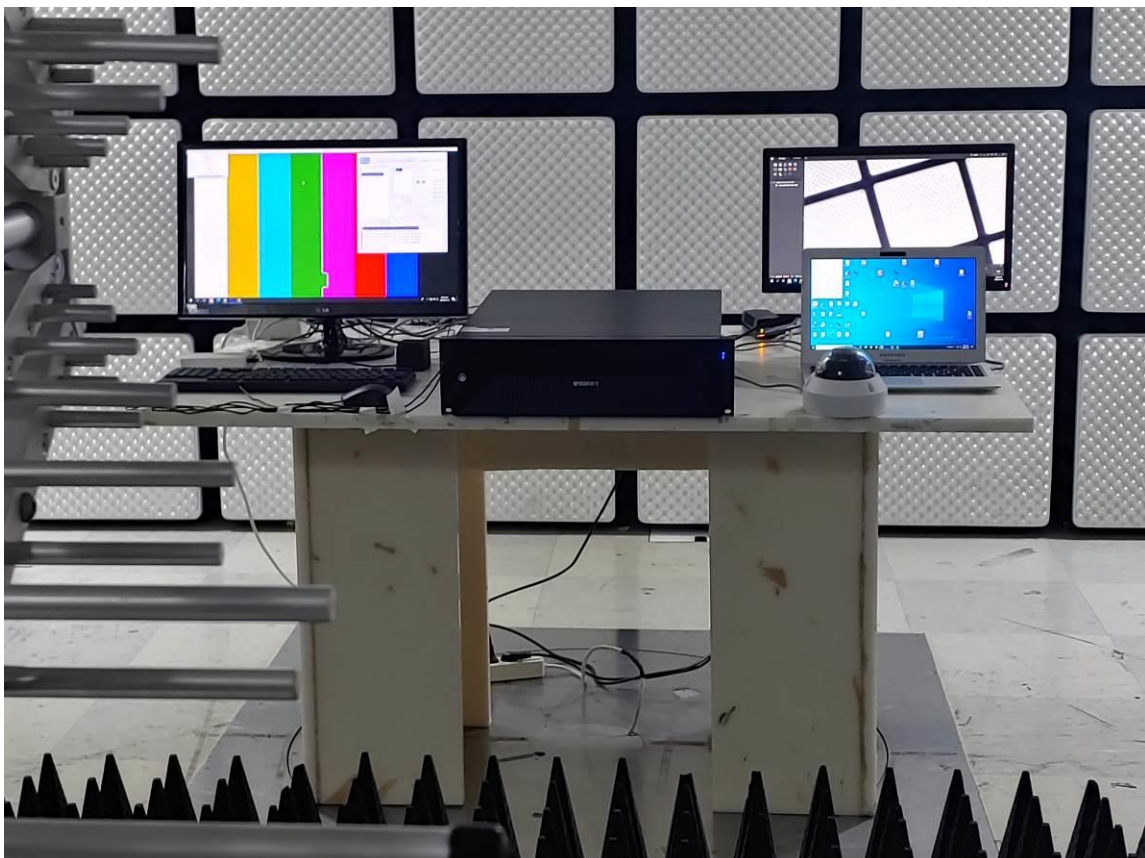
Harmonic Current Emission / Voltage Fluctuations and Flicker



Electrostatic Discharge



RF Electromagnetic Field



Electrical Fast Transients



Surges



Conducted Disturbances, Induced by Radio-Frequency Fields



Main supply voltage (dips, variations) short interruptions



EUT



EUT

