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EMC TEST REPORT

Dates of Tests: May 02 - 10, 2022
Test Report S/N: LR500122205D
Test Site : LTA Co., Ltd.

Model No.

SPE-1630

APPLICANT

Hanwha Techwin Co., Ltd

Equipment Name : Network Video Encoder
 Manufacturer : HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.
 Model name : SPE-1630
 Test Device Serial No.: Identification
 Directive : Electromagnetic Compatibility Directive 2014/30/EU,
 Regulations 2016/1091
 Rule Part(s) : EN 55032:2015/A11:2020, BS EN 55032:2015/A11:2020
 EN 50130-4:2011/A1:2014, BS EN 50130-4:2011/A1:2014
 EN IEC 61000-3-2:2019, BS EN IEC 61000-3-2:2019
 EN 61000-3-3:2013/A1:2019, BS EN 61000-3-3:2013/A1:2019
 Data of reissue : May 12, 2022

This test report is issued under the authority of:

The test was supervised by:

Young Kyu Shin, Technical Manager

Joo Hyung Cho, Test Engineer

This test result only responds to the tested sample. It is not allowed to
copy this report even partly without the allowance of the test
laboratory. The report must not be used by the client to claim product
certification, approval, or endorsement by NVLAP, NIST, or any
agency of the Federal Government.

This test report is not related to KS Q ISO/IEC 17025 and KOLAS
accreditation.



Revision history

Revision	Date of issue	Test report No.	Description
0	12.05.2022	LR500122205D	Initial

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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
 Web site : <http://www.ltalab.com>
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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	2022-09-30	ECT accredited Lab.
	KOREA		-	
RRA	U.S.A	KR0049	2023-04-08	RRA accredited Lab.
	CANADA		2022-10-18	
		C-14948	2023-09-10	
VCCI	JAPAN	T-12416	2023-09-10	VCCI registration
		R-14483	2023-10-15	
		G-10847	2024-12-13	
KOLAS	KOREA	KT551	2025-10-12	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 : Network Video Encoder
 Model name : SPE-1630
 Serial number : Identification
 Date of receipt : April 26, 2022
 EUT condition : Pre-production
 Interface Ports : DC IN, GND, BNC #1 ~ #16, HDMI, LAN, AUDIO IN #1 ~ #2, AUDIO OUT, RS485, ALARM IN #1 ~ #16, ALARM OUT #1 ~ #8
 Power rating : AC 230 V, 50 Hz

2-3 Modification

- Insert Gasket Tape at Internal.

2-4 Model Specification

- NONE

2-5 Test conditions

Temp. / Humid. / Pressure : (20 - 23) °C / (32 - 43) % R.H. / (99.7 – 100.1) kPa
 Tested Model : SPE-1630
 Test mode : Network Video Encoder mode
 Tested Voltage : AC 230 V, 50 Hz

2-6 List of EUT and ACCESSORY

EUT				
Equipment Name	Model Name	Serial No.	Manufacturer	Remarks
Network Video Encoder	SPE-1630	N/A	HANWHA TECHWIN SECURITY VIETNAM CO.,LTD. D-TECH CO.,LTD.	-
Adapter	FSP060-DHAN3	N/A	Zhonghan Electronics (Shenzhen) Co., Ltd.	-
ACCESSORY				
Equipment Name	Model Name	Serial No.	Manufacturer	Remarks
Headset	SHS-150V/W	N/A	SAMSUNG	-
Mobile phone	SHW-M250K	N/A	SAMSUNG	-
ALARM JIG	N/A	N/A	N/A	-
Notebook	MS-16GB	N/A	MSI	-
Notebook Adapter	A10-090P3A	N/A	Chicony	-
Monitor	24MT58DF	N/A	LG	-
Monitor Adapter	ADS-40FSG-19	N/A	LG	-
Network Video Encoder #2	SPE-410	N/A	HANWHA TECHWIN SECURITY VIETNAM CO.,LTD. D-TECH CO.,LTD.	3 EA
Network Video Encoder #2 Adapter	2ACB022F	N/A	Channel Well Technology (Guangzhou) Co., Ltd.	3 EA
ANALOG CAMERA	HCD-7010RA	N/A	HANWHA TECHWIN SECURITY VIETNAM CO.,LTD. D-TECH CO.,LTD.	-
ANALOG CAMERA Adapter	DAD12050DKA	N/A	Dream Electronic Co.,Ltd	-
RS485 to USB Convertor	LCC-COMS- 485usb	N/A	LIGHT COM	-

2-7 Cable List

Cable List						
From		To		Length (m)	Shielding	
Type	I/O Port	Type	I/O Port		Cable	backshell
EUT	DC IN	Adapter	DC OUT	1.3	NO	Plastic
	GND	GND	GND	1.5	NO	Plastic
	BNC #1 ~ #8	Network Video Encoder #2 1	BNC #1 ~ #8	3.0	YES	Metal
	BNC #9 ~ #16	Network Video Encoder #2 2	BNC #9 ~ #16	3.0	YES	Metal
	HDMI	Monitor	HDMI	1.5	YES	Plastic
	LAN	Notebook	LAN	3.0	NO	Plastic
	AUDIO IN #1	Notebook	AUDIO OUT	3.0	NO	Plastic
	AUDIO IN #2	Mobile phone	AUDIO OUT	3.0	NO	Plastic

From		To		Length (m)	Shielding	
Type	I/O Port	Type	I/O Port		Cable	backshell
EUT	AUDIO OUT	Headset	AUDIO IN	1.7	NO	Plastic
	RS485	RS485 to USB Convertor	RS485	3.0	NO	Plastic
	ALARM IN #1 ~ #16	ALARM JIG	ALARM OUT #1 ~ #16	3.0	NO	Plastic
	ALARM OUT #1 ~ #8	ALARM JIG	ALARM IN #1 ~ #8	3.0	NO	Plastic
Adapter	AC IN	AC Power Source	3 Pin AC Line	1.5	NO	Plastic
Monitor	DC IN	Monitor Adapter	DC OUT	1.3	NO	Plastic
Monitor Adapter	AC IN	AC Power Source	2 Pin AC Line	-	NO	Plastic
Notebook	DC IN	Notebook Adapter	DC OUT	1.4	NO	Plastic
	USB	RS485 to USB Convertor	USB	1.0	NO	Plastic
Notebook Adapter	AC IN	AC Power Source	3 Pin AC Line	1.5	NO	Plastic
Network Video Encoder #2 1	DC IN	Network Video Encoder #2 1 Adapter	DC OUT	1.2	NO	Plastic
	BNC #9	Network Video Encoder #2 3	BNC #1	1.5	YES	Metal
Network Video Encoder #2 1 Adapter	AC IN	AC Power Source	2 Pin AC Line	1.5	NO	Plastic
Network Video Encoder #2 2	DC IN	Network Video Encoder #2 2 Adapter	DC OUT	1.2	NO	Plastic
	BNC #9	Network Video Encoder #2 3	BNC #2	1.5	YES	Metal
Network Video Encoder #2 2 Adapter	AC IN	AC Power Source	2 Pin AC Line	1.5	NO	Plastic
Network Video Encoder #2 3	DC IN	Network Video Encoder #2 3 Adapter	DC OUT	1.2	NO	Plastic
	BNC #3	ANALOG CAMERA	BNC	1.5	YES	Metal
Network Video Encoder #2 3	DC IN	Network Video Encoder #2 3 Adapter	DC OUT	1.2	NO	Plastic
	BNC #3	ANALOG CAMERA	BNC	1.5	YES	Metal
Network Video Encoder #2 3 Adapter	AC IN	AC Power Source	2 Pin AC Line	1.5	NO	Plastic
ANALOG CAMERA	DC IN	ANALOG CAMERA Adapter	DC OUT	1.4	NO	Plastic
ANALOG CAMERA Adapter	AC IN	AC Power Source	2 Pin AC Line	1.5	NO	Plastic

3. Test Report

3.1 Summary of tests

Reference	Parameter	Status (note)
I. Emission		
Conducted Emissions	EN 55032:2015/A11:2020, BS EN 55032:2015/A11:2020	C
Radiated Emissions	EN 55032:2015/A11:2020, BS EN 55032:2015/A11:2020	C
Harmonic Current Emission	EN IEC 61000-3-2:2019, BS EN IEC 61000-3-2:2019	NA ^{Note 3}
Voltage Fluctuations and Flicker	EN 61000-3-3:2013/A1:2019, BS EN 61000-3-3:2013/A1:2019	C
II. Immunity (EN 50130-4:2011/A1:2014, BS EN 50130-4:2011/A1:2014)		
Electrostatic Discharge	EN 61000-4-2:2009, BS EN 61000-4-2:2009	C
RF Electromagnetic Field	EN 61000-4-3:2006/A1:2008/A2:2010, BS EN 61000-4-3:2006/A1:2008/A2:2010	C
Electrical Fast Transients	EN 61000-4-4:2012, BS EN 61000-4-4:2012	C
Surges	EN 61000-4-5:2014/A1:2017, BS EN 61000-4-5:2014/A1:2017	C
Conducted Disturbances, Induced by Radio-Frequency Fields	EN 61000-4-6:2014/AC:2015, BS EN 61000-4-6:2014/AC:2015	C
Voltage dips and Interruptions	EN 61000-4-11:2004/A1:2017, BS EN 61000-4-11:2004/A1:2017	C
Main supply voltage variations	EN 50130-4:2011/A1:2014, BS 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.

Note 3: We did not test EN IEC 61000-3-2, BS EN IEC 61000-3-2 (Harmonic current emissions) for the SPE-1630 because equipment whose rated power is less or equal 75 W don't need to be tested.

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/A11:2020, BS EN 55032:2015/A11:2020
Measurement RBW	: 9 kHz
Test Location	: Shielded Room
Test mode	: Network Video Encoder 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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EUT /Model No. : SPE-1630

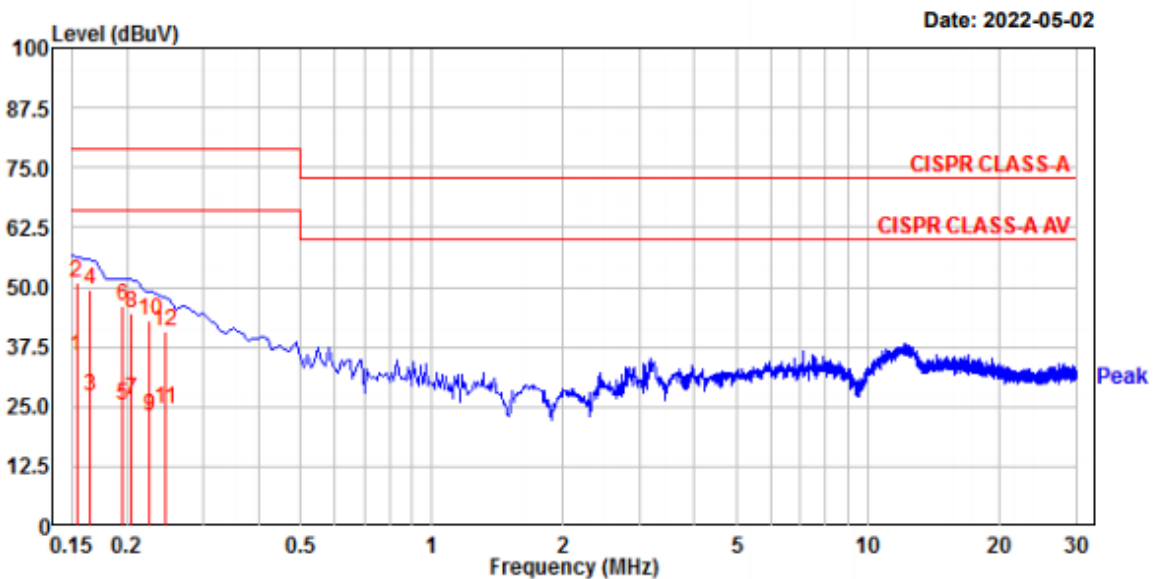
Phase : Line

Test Mode : Network Video Encoder mode

Test Power : 230 V / 50 Hz

Temp./ Humi. : 21 'C / 39 % R.H

Test Engineer : CHO 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.	0.153	31.57	15.89	19.47	51.04	35.36	79.00	66.00	27.96	30.64	Line
4.	0.165	29.83	7.77	19.47	49.30	27.24	79.00	66.00	29.70	38.76	Line
6.	0.196	26.67	5.89	19.47	46.14	25.36	79.00	66.00	32.86	40.64	Line
8.	0.205	25.13	6.85	19.47	44.60	26.32	79.00	66.00	34.40	39.68	Line
10.	0.226	23.44	3.41	19.47	42.91	22.88	79.00	66.00	36.09	43.12	Line
12.	0.244	21.22	4.93	19.47	40.69	24.40	79.00	66.00	38.31	41.60	Line

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

Conducted Emissions (NEUTRAL)



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EUT /Model No. : SPE-1630

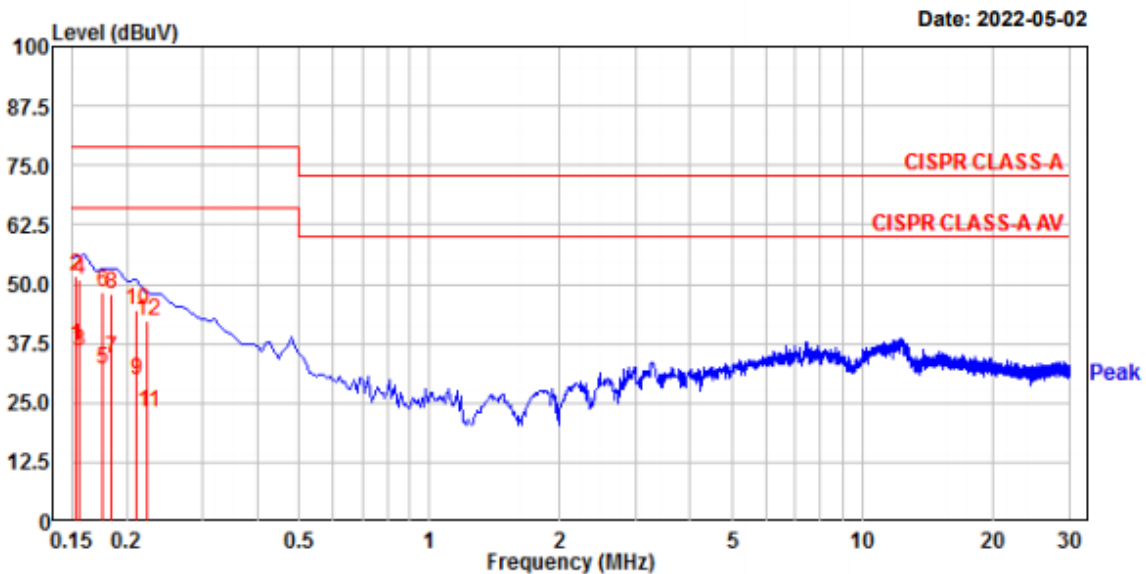
Phase : Neutral

Test Mode : Network Video Encoder mode

Test Power : 230 V / 50 Hz

Temp./ Humi. : 21 'C / 39 % R.H

Test Engineer : CHO J H



No.	Freq MHz	RD QP dBμV	RD AV dBμV	C.F dB	Result QP dBμV	Result AV dBμV	Limit QP dBμV	Limit AV dBμV	Margin QP dB	Margin AV dB	Phase
2.	0.153	32.04	17.50	19.50	51.54	37.00	79.00	66.00	27.46	29.00	neutral
4.	0.156	31.41	16.35	19.50	50.91	35.85	79.00	66.00	28.09	30.15	neutral
6.	0.176	28.90	12.75	19.49	48.39	32.24	79.00	66.00	30.61	33.76	neutral
8.	0.185	28.27	14.69	19.49	47.76	34.18	79.00	66.00	31.24	31.82	neutral
10.	0.210	25.12	10.41	19.49	44.61	29.90	79.00	66.00	34.39	36.10	neutral
12.	0.224	22.64	3.64	19.49	42.13	23.13	79.00	66.00	36.87	42.87	neutral

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

Conducted Emissions (TEL_10 M)



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EUT /Model No. : SPE-1630

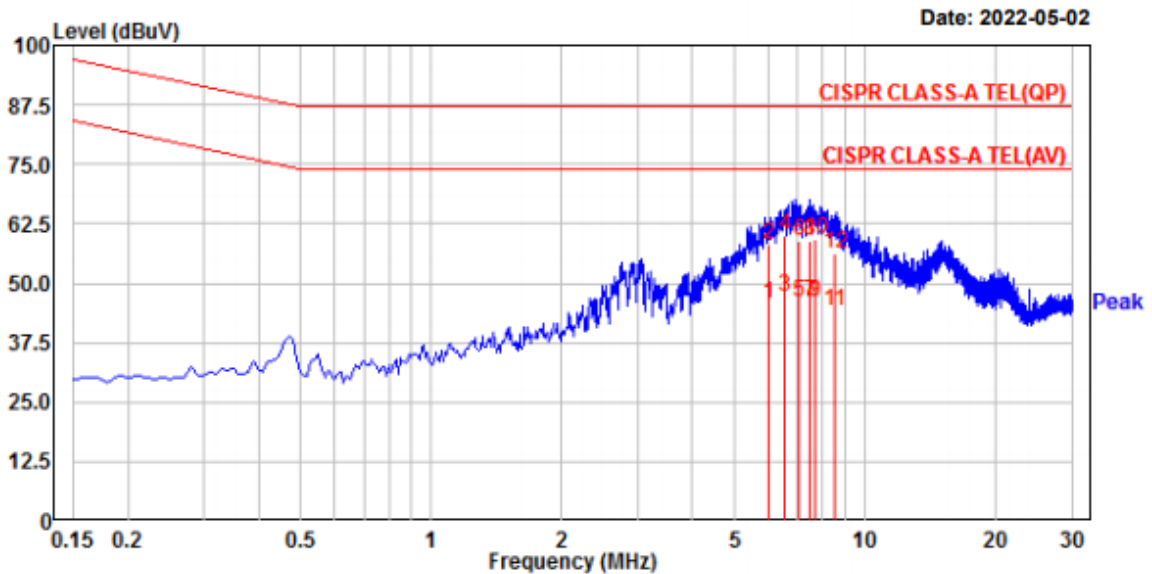
Phase : TEL_10M

Test Mode : Network Video Encoder mode

Test Power : 230 V / 50 Hz

Temp./ Humi. : 21 'C / 39 % R.H

Test Engineer : CHO J H



No.	Freq MHz	RD QP dBμV	RD AV dBμV	C.F dB	Result QP dBμV	Result AV dBμV	Limit QP dBμV	Limit AV dBμV	Margin QP dB	Margin AV dB	Phase
2.	5.985	38.44	26.00	19.55	57.99	45.55	87.00	74.00	29.01	28.45	Line
4.	6.542	40.37	27.67	19.56	59.93	47.23	87.00	74.00	27.07	26.77	Line
6.	7.023	39.25	26.56	19.57	58.82	46.13	87.00	74.00	28.18	27.87	Line
8.	7.441	39.39	26.32	19.59	58.98	45.91	87.00	74.00	28.02	28.09	Line
10.	7.682	39.51	26.44	19.60	59.11	46.04	87.00	74.00	27.89	27.96	Line
12.	8.481	36.61	24.34	19.64	56.25	43.98	87.00	74.00	30.75	30.02	Line

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

Conducted Emissions (TEL_1000 M)



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EUT /Model No. : SPE-1630

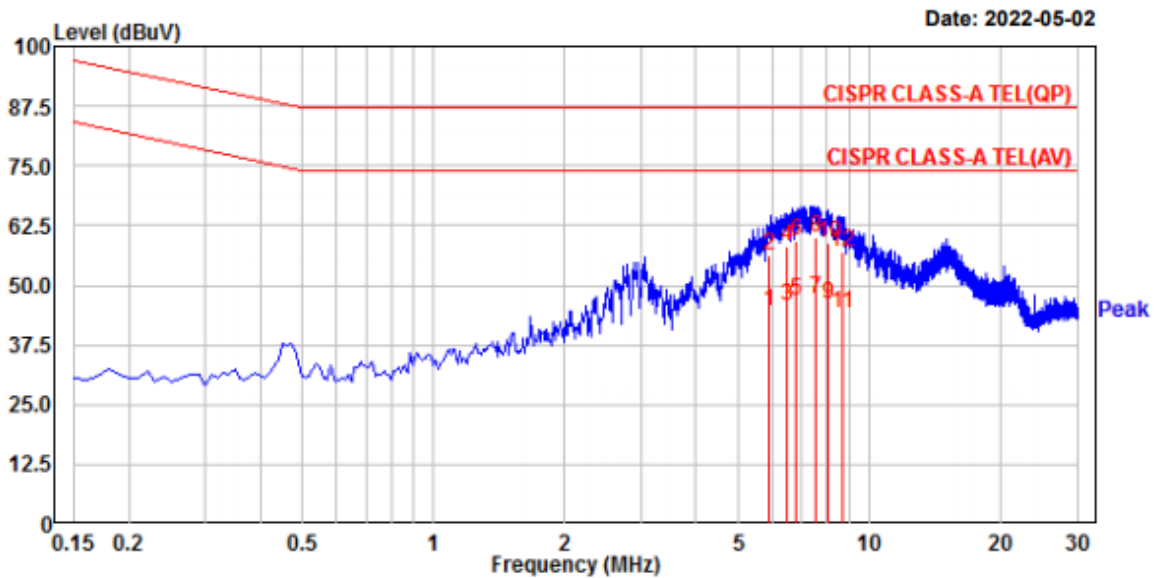
Phase : TEL_1000M

Test Mode : Network Video Encoder mode

Test Power : 230 V / 50 Hz

Temp./ Humi. : 21 'C / 39 % R.H

Test Engineer : CHO J H



No.	Freq MHz	RD QP dBμV	RD AV dBμV	C.F dB	Result QP dBμV	Result AV dBμV	Limit QP dBμV	Limit AV dBμV	Margin QP dB	Margin AV dB	Phase
2.	5.901	36.97	25.35	19.32	56.29	44.67	87.00	74.00	30.71	29.33	Line
4.	6.451	38.74	26.22	19.33	58.07	45.55	87.00	74.00	28.93	28.45	Line
6.	6.784	39.81	27.51	19.34	59.15	46.85	87.00	74.00	27.85	27.15	Line
8.	7.518	40.73	27.67	19.37	60.10	47.04	87.00	74.00	26.90	26.96	Line
10.	8.012	39.48	26.50	19.39	58.87	45.89	87.00	74.00	28.13	28.11	Line
12.	8.635	37.62	24.58	19.41	57.03	43.99	87.00	74.00	29.97	30.01	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/A11:2020, BS EN 55032:2015/A11:2020
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 Location	: 10 m Chamber
Test mode	: Network Video Encoder 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 : 1.2 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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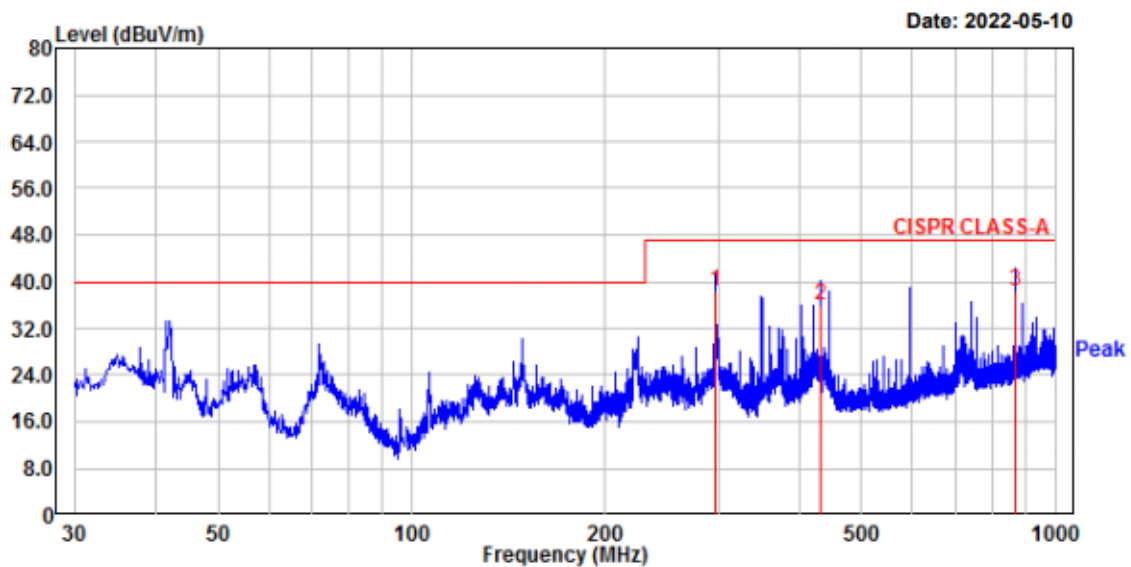
EUT/Model No.: SPE-1630

Temp/Humi: 20 °C / 43 % R.H.

Test Mode : Network Video Encoder mode

Tested by: CHO J H

Power : 230 V / 50 Hz



No.	Freq MHz	Reading dB μ V	C.F dB	Result QP dB μ V/m	Limit dB μ V/m	Margin dB	Height cm	Angle deg	Polarity
1.	296.99	47.62	-9.16	38.46	47.00	8.54	100	15	vertical
2.	431.94	40.48	-4.44	36.04	47.00	10.96	139	360	vertical
3.	864.08	34.11	4.14	38.25	47.00	8.75	389	199	vertical

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

Radiated Emissions (Below 1 GHz) / H



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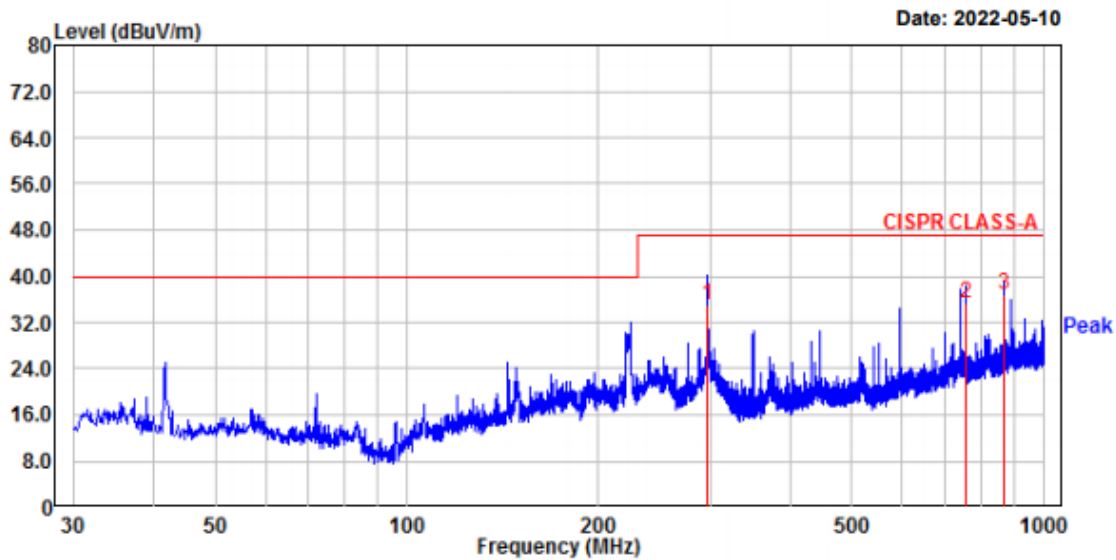
EUT/Model No.: SPE-1630

Temp/Humi: 20 'C / 43 % R.H.

Test Mode : Network Video Encoder mode

Tested by: CHO J H

Power : 230 V / 50 Hz



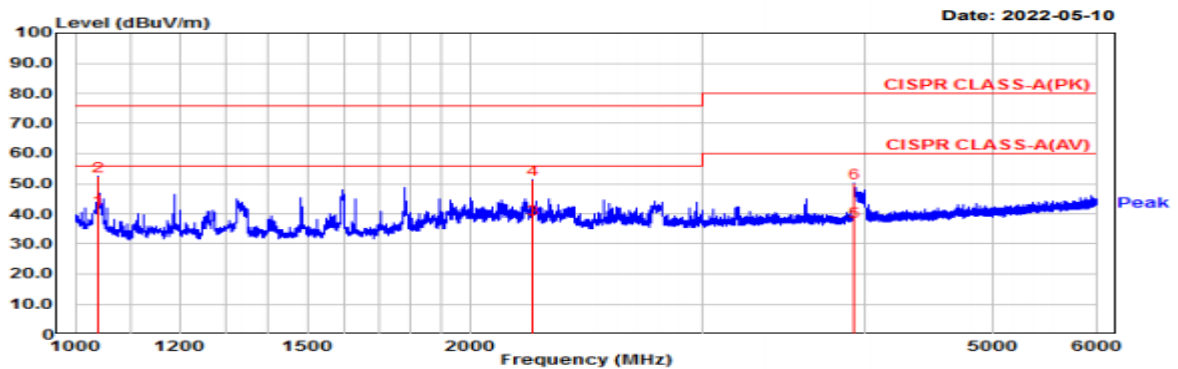
No.	Freq MHz	Reading dBμV	C.F dB	Result QP dBμV/m	Limit dBμV/m	Margin dB	Height cm	Angle deg	Polarity
1.	296.99	44.20	-9.16	35.04	47.00	11.96	383	46	horizontal
2.	756.05	32.57	2.82	35.39	47.00	11.61	132	168	horizontal
3.	864.08	32.83	4.14	36.97	47.00	10.03	118	142	horizontal

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

Radiated Emissions

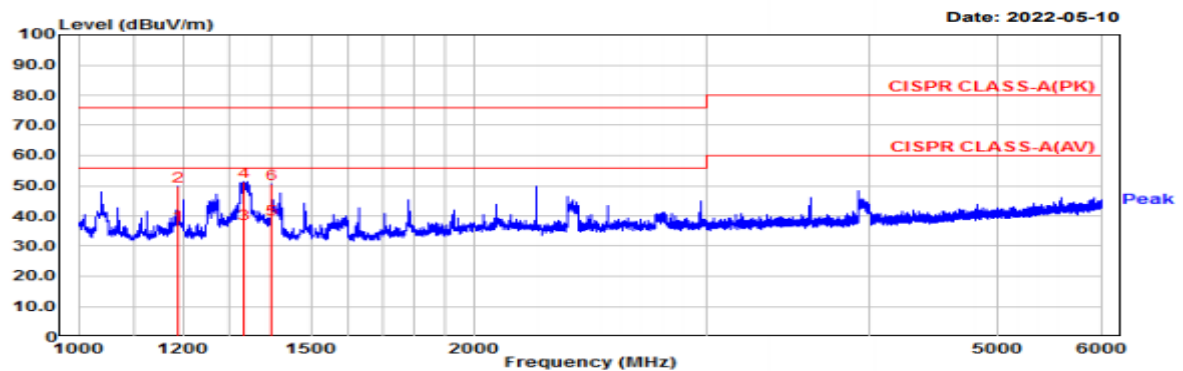
(Above 1 GHz) / V

EUT/Model No.: SPE-1630 Temp/Humi: 20 °C / 43 % R.H.
 Test Mode : Network Video Encoder mode Tested by: CHO J H
 Power : 230 V / 50 Hz



(Above 1 GHz) / H

EUT/Model No.: SPE-1630 Temp/Humi: 20 °C / 43 % R.H.
 Test Mode : Network Video Encoder mode Tested by: CHO J H
 Power : 230 V / 50 Hz



Manufacture : HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.

Test Date

Temp.:
[°C]Humidity:
[%]Distance
(m)

Model : SPE-1630

2022-05-10

20.00

43.00

3.6

TEST mode : Network Video Encoder 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
1187.50	58.09	45.09	-6.53	51.56	38.56	76.00	56.00	24.44	17.44	100	62	H
1333.75	58.09	44.09	-5.18	52.91	38.91	76.00	56.00	23.09	17.09	100	122	H
1398.75	57.20	45.20	-4.88	52.32	40.32	76.00	56.00	23.68	15.68	100	86	H
1038.75	62.05	51.05	-7.89	54.16	43.16	76.00	56.00	21.84	12.84	100	212	V
2227.50	52.35	39.35	0.49	52.84	39.84	76.00	56.00	23.16	16.16	100	32	V
3920.63	45.13	32.13	6.75	51.88	38.88	80.00	60.00	28.12	21.12	100	60	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 IEC 61000-3-2:2019, BS EN IEC 61000-3-2:2019
Test Location	: Shielded Room
Test mode	: Network Video Encoder mode
Rated power	: 15.337 W
Result	: Not Applicable

Measurement Data:

- We did not test EN IEC 61000-3-2 (Harmonic Current Emission) for the SPE-1630 because equipment whose rated power is less or equal 75 W don't need to be tested..

Harmonic Current Emission

02nd May 2022 - 09:13:38		Ph:1 Page 1/1		IECSoft v2_7	
		BS EN 61000-3-2:2019 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	Network Video Encoder				
Equipment Under Test					
Brand	Hanwha Techwin Co., Ltd.				
Model	SPE-1630				
Serial	N/A				
Impedance Network ID	N/A				
Test Conditions					
	User Entered	Measured			
Rated Voltage	N/A	229.941V			
Rated Current	N/A	209.689mA			
Rated Frequency	N/A	50.000Hz			
Rated Power	N/A	15.337W			
Additional Test Information					
Measured Power Factor	0.3181				
Max Current THD	279.28%				
Average THC	198.603mA				
Max Power	15.399W				
Max F.Current	72.759mA				
Average F.Current	71.824mA				
Minimum Current	100A				
Test Duration	2.5 minutes				
Additional Test Details					
Operator	CHO J H				
Lab Name	N/A				
Location	N/A				
Notes	22 °C, 35 % R.H.				
Signature					
Results	Test - N/A. Rated Power < 75W				

Test not applicable

With the exception of lighting equipment section 7 of the BS EN 61000-3-2:2019 standard declares that no Harmonic current limits are specified for equipment with a rated power of 75W or less.

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/A1:2019, BS EN 61000-3-3:2013/A1:2019
Test Location	: Shielded Room
Test mode	: Network Video Encoder mode
Result	: Complies

Measurement Data:

- Refer to the Next page

Voltage Fluctuations and Flicker

02nd May 2022 - 09:25:04		Ph:1 Page 1/2		IECSoft v2_7	
		BS EN 61000-3-3:2013+AMD1:2019			
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	Network Video Encoder (4.0%)				
Minimum Current	10A				
PST	10 minutes				
PLT	12 PSTs				
Equipment Under Test					
Brand	Hanwha Techwin Co., Ltd.				
Model	SPE-1630				
Serial	N/A				
Impedance Network ID	N/A				
Test Conditions					
	User Entered		Measured		
Rated Voltage	N/A		229.958V		
Rated Current	N/A		N/A		
Rated Frequency	N/A		50.000Hz		
Rated Power	N/A		N/A		
D max	0.0612% (Limit: 4.0%)				
T max	0.0000 s (Limit: 0.5 s)				
DC max	0.0034% (Limit: 3.3%)				
Additional Test Details					
Operator	CHO J H				
Lab Name	N/A				
Location	N/A				
Notes	22 °C, 35 % R.H.				
Signature					
Results	Phase1: PASS				

02nd May 2022 - 09:25:04		Ph:1 Page 2/2		IECSoft v2_7				
BS EN 61000-3-3:2013+AMD1:2019 Flickermeter								
Instrument Details								
Instrument Model	PPA5511							
Instrument Serial	162-04957							
Instrument Firmware	2.179							
Equipment Under Test								
Brand	Hanwha Techwin Co., Ltd.							
Model	SPE-1630							
Serial	N/A							
Flicker Test Results								
PST no.	Status	DC (%)	Dmax (%)	Tmax (s)	PST	PST Lim	PLT	PLT Lim
1	Phase1: NO RESULTS	0.00342	0.06012	0.00000	0.08226	1.00000	0.08226	N/A
2	Phase1: PASS	0.00342	0.06097	0.00000	0.08226	1.00000	0.08226	N/A
3	Phase1: PASS	0.00342	0.06097	0.00000	0.08226	1.00000	0.08226	N/A
4	Phase1: PASS	0.00342	0.06097	0.00000	0.08226	1.00000	0.08226	N/A
5	Phase1: PASS	0.00342	0.06097	0.00000	0.08226	1.00000	0.08226	N/A
6	Phase1: PASS	0.00342	0.06097	0.00000	0.08226	1.00000	0.08226	N/A
7	Phase1: PASS	0.00342	0.06097	0.00000	0.08226	1.00000	0.08226	N/A
8	Phase1: PASS	0.00342	0.06097	0.00000	0.08226	1.00000	0.08226	N/A
9	Phase1: PASS	0.00342	0.06097	0.00000	0.08226	1.00000	0.08226	N/A
10	Phase1: PASS	0.00342	0.06097	0.00000	0.08226	1.00000	0.08226	N/A
11	Phase1: PASS	0.00342	0.06122	0.00000	0.08226	1.00000	0.08226	N/A
12	Phase1: PASS	0.00342	0.06122	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	: 2022. 05. 03.
Test method	: EN 61000-4-2 :2009, BS EN 61000-4-2 :2009
Temperature / Humidity / Pressure	: 23 °C / 33 % R.H. / 100.1 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 Location	: Shielded Room
Test mode	: Network Video Encoder mode
Result	: Complies

Measurement Data:

- Refer to the Next page

ESD Test Point and Result**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

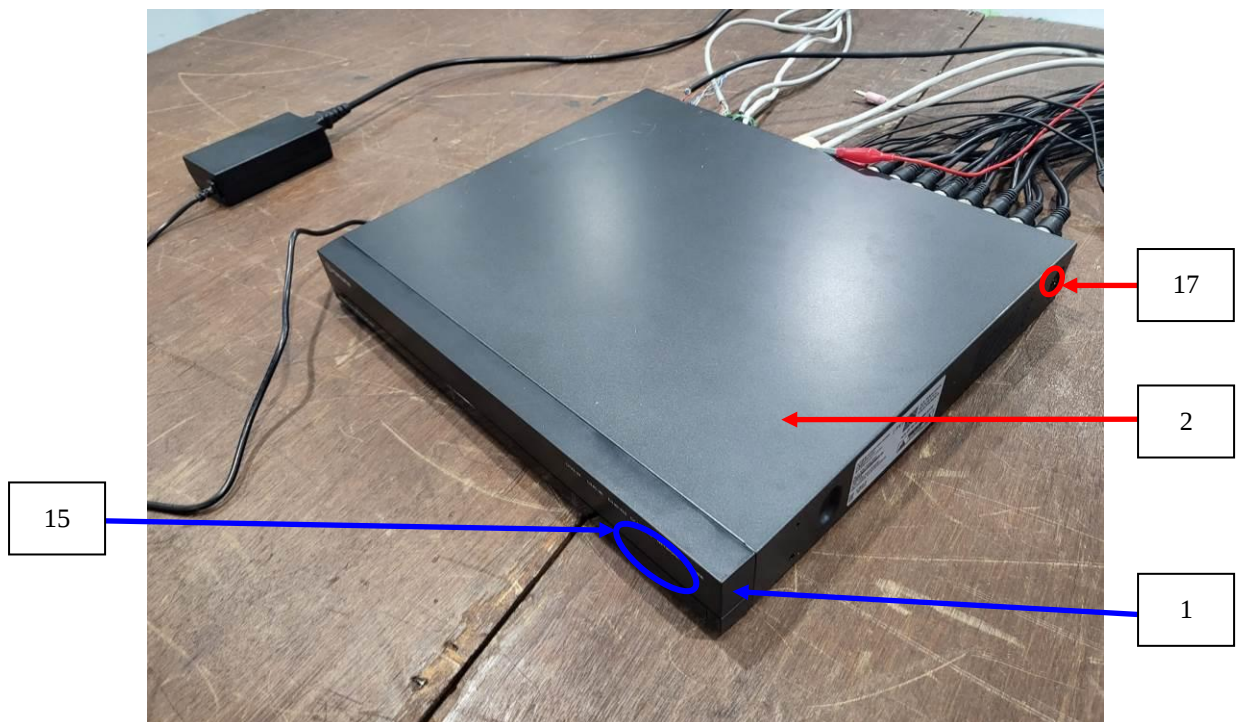
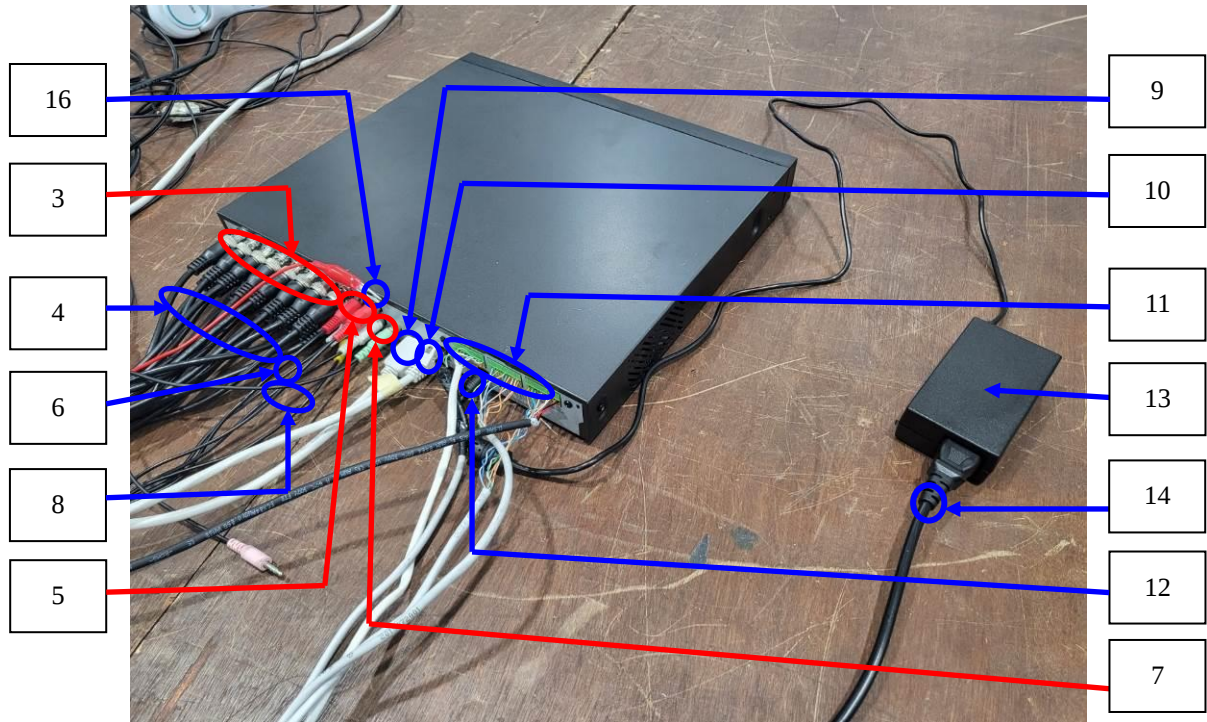
1-2. Direct Discharge

No.	Position	Kind of Discharge	Result	Remarks
1	Enclosure #1	Air	Complies	No reaction recognized
2	Enclosure #2	Contact	Complies	No reaction recognized
3	BNC Port	Contact	Complies	No reaction recognized
4	BNC Cable	Air	Complies	No reaction recognized
5	AUDIO IN Port	Contact	Complies	No reaction recognized
6	AUDIO IN Cable	Air	Complies	No reaction recognized
7	AUDIO OUT Port	Contact	Complies	No reaction recognized
8	AUDIO OUT Cable	Air	Complies	No reaction recognized
9	HDMI	Air	Complies	No reaction recognized
10	LAN	Air	Complies	No reaction recognized
11	ALARM IN, OUT	Air	Complies	No reaction recognized
12	DC IN	Air	Complies	No reaction recognized
13	Adapter	Air	Complies	No reaction recognized
14	AC IN	Air	Complies	No reaction recognized
15	LED	Air	Complies	No reaction recognized
16	GND	Air	Complies	No reaction recognized
17	Screw	Contact	Complies	No reaction recognized

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	: 2022. 05. 09.
Test method	: EN 61000-4-3:2006/A1:2008/A2:2010, BS EN 61000-4-3:2006/A1:2008/A2:2010
Temperature / Humidity / Pressure	: 22 °C / 34 % R.H. / 99.7 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 Location	: 3 m Chamber
Test mode	: Network Video Encoder 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	: 2022. 05. 04.
Test method	: EN 61000-4-4:2012, BS EN 61000-4-4:2012
Temperature / Humidity / Pressure	: 23 °C / 34 % R.H. / 99.9 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 Location	: Shielded Room
Test mode	: Network Video Encoder 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 kV	Complies	No reaction recognized
RS485	±1 kV	Complies	No reaction recognized
ALARM IN	±1 kV	Complies	No reaction recognized
ALARM OUT	±1 kV	Complies	No reaction recognized
BNC	±1 kV	Complies	No reaction recognized
AUDIO IN	±1 kV	Complies	No reaction recognized
AUDIO OUT	±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	: 2022. 05. 04.
Test method	: EN 61000-4-5:2014/A1:2017, BS EN 61000-4-5:2014/A1:2017
Temperature / Humidity / Pressure	: 22 °C / 35 % R.H. / 99.9 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 μ s pulse
Number of surges	: 5 (at each phase)
Test Location	: Shielded Room
Test mode	: Network Video Encoder mode
Result	: Complies

Measurement Data:

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

Signal Line	level	Result	Remark
LAN	$\pm(0.5, 1.0)$ kV	Complies	No reaction recognized
RS485	$\pm(0.5, 1.0)$ kV	Complies	No reaction recognized
ALARM IN	$\pm(0.5, 1.0)$ kV	Complies	No reaction recognized
ALARM OUT	$\pm(0.5, 1.0)$ kV	Complies	No reaction recognized
BNC	$\pm(0.5, 1.0)$ kV	Complies	No reaction recognized
AUDIO IN	$\pm(0.5, 1.0)$ kV	Complies	No reaction recognized
AUDIO OUT	$\pm(0.5, 1.0)$ 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	: 2022. 05. 03.
Test method	: EN 61000-4-6:2014/AC:2015, BS EN 61000-4-6:2014/AC:2015
Temperature / Humidity / Pressure	: 23 °C / 32 % R.H. / 99.8 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 Location	: Shielded Room
Test mode	: Network Video Encoder mode
Result	: Complies

Measurement Data:

Power Port	Result	Remarks
Power	Complies	No reaction recognized
GND	Complies	No reaction recognized

Signal Port	Result	Remarks
LAN	Complies	No reaction recognized
RS485	Complies	No reaction recognized
ALARM IN	Complies	No reaction recognized
ALARM OUT	Complies	No reaction recognized
BNC	Complies	No reaction recognized
AUDIO IN	Complies	No reaction recognized
AUDIO OUT	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	: 2022. 05. 04.
Test method	: EN 61000-4-11:2004/A1:2017, BS EN 61000-4-11:2004/A1:2017
Temperature / Humidity / Pressure	: 23 °C / 32 % R.H. / 99.9 kPa
Ut	: 230 Vac
Test Location	: Shielded Room
Test mode	: Network Video Encoder mode
Result	: Complies

Measurement Data:

Test Level %Ut	Voltage droop and interruptions %Ut	Duration of Reduction (period)	Result	Remarks
80	20	250	Complies	No reaction recognized
70	30	25	Complies	No reaction recognized
40	60	10	Complies	No reaction recognized
0	100	250	Complies	EUT was turned off during the test. Re-operation without user's control. After the test, EUT was normally operated.

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	: 2022. 05. 04.
Test method	: EN 50130-4:2011/A1:2014, BS EN 50130-4:2011/A1:2014
Temperature / Humidity / Pressure	: 23 °C / 32 % R.H. / 99.9 kPa
Supply Voltage maximum	: $U_{nom} + 10 \%$
Supply Voltage minimum	: $U_{nom} - 15 \%$
Ut	: 230 Vac
Test Location	: Shielded Room
Test mode	: Network Video Encoder 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.

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	2023.03.14	1 year
☒	Pulse Limiter	ESH3-Z2	Rohde & Schwarz	100710	2023.03.14	1 year
☒	ISN	ISN T800	TESEQ	27109	2022.09.06	1 year
☒	ISN	ENY81-CA6	Rohde & Schwarz	101565	2022.09.06	1 year
☐	ISN	ISN S8	Schwarzbeck	79	2022.09.02	1 year
☐	CURRENT PROBE	EZ-17	Rohde & Schwarz	100508	2022.09.02	1 year
☐	CDN	TSCDN-C1-BNC-75	F.C.C	07004	2023.03.14	1 year
☐	LISN	ESH3-Z6	Rohde & Schwarz	100378	2022.09.02	1 year
☐	LISN	ESH3-Z6	Rohde & Schwarz	101468	2022.09.02	1 year
☒	LISN(main)	ENV216	Rohde & Schwarz	100408	2022.09.02	1 year
☒	LISN(sub)	LT32C/10	AFJ	32031518210	2022.09.02	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	ESCI7	Rohde & Schwarz	100772	2022.09.02	1 year
☒	Amplifier	8447D	HP	1937A03453	2022.11.30	1 year
☒	BILOG Antenna	VULB 9168	SCHWARZBECK	775	2023.03.22	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	ESCI7	Rohde & Schwarz	100772	2022.09.02	1 year
☐	EMI TEST Receiver	ESU	Rohde & Schwarz	100092	2022.09.02	1 year
☒	Amplifier	8449B	Agilent	3008A02126	2023.03.14	1 year
☐	Amplifier	PAM-840A	COM-POWER	461314	2023.03.17	1 year
☐	HORN ANTENNA	3116B	ETS	133350	2024.03.22	1 year
☐	HORN ANTENNA	3116B	ETS	81109	2024.04.25	1 year
☒	HORN ANTENNA	3115	ETS	114105	2023.05.12	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	2022.09.06	1 year
☒	Reference Impedance Network	ES4152	NF Corp.	9074424	2022.09.14	1 year

Electrostatic Discharge

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	ESD Simulator	ESS-2000	NOISEKEN	8000C03241	2022.09.09	1 year
☒	ESD GUN	TC-815R	NOISEKEN	ESS0382069	2022.09.09	1 year

RF Electromagnetic Field

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Signal Generator	E4432B	Agilent	MY41310673	2022.09.02	1 year
☒	Power Meter	E4419B	Agilent	GB38410133	2023.03.15	1 year
☒	Power Sensor	E9300A	Agilent	MY41497992	2023.03.15	1 year
☒	Power Sensor	E9300A	Agilent	MY41497618	2023.03.15	1 year
☒	WIDE BAND HIGH POWER AMPLIFIER	ITA0300KL-500	INFINITECH	0300KL 20 09 001	-	-
☒	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	-	-

Electrical Fast Transients

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Compact Generator	Compact NX	EMTEST	P1725200196	2022.09.02	1 year
☒	AC Power Source	Variac NX	EMTEST	P1745207276	2022.09.02	1 year
☒	Capacitive Coupling Clamp	CCI	EMTEST	P1744207071	2022.09.02	1 year

Surges

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Compact Generator	Compact NX	EMTEST	P1725200196	2022.09.02	1 year
☒	AC Power Source	Variac NX	EMTEST	P1745207276	2022.09.02	1 year
☒	CDN	CNV 508T5	EMTEST	P1742204978	2022.09.03	1 year
☐	CDN	CNV 508N1	EMTEST	P1742204940	2022.09.03	1 year

Conducted Disturbances, Induced by Radio-Frequency Fields

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Signal generator	SML03	R&S	103026/0013	2023.03.15	1 year
☒	POWER METER	NRVD	R&S	101689	2023.03.15	1 year
☒	POWER Sensor	URV5-Z2	R&S	100755	2023.03.15	1 year
☒	POWER Sensor	URV5-Z2	R&S	100756	2023.03.15	1 year
☒	RF Power Amplifier	FLL75A	FRANKONIA	1033	-	-
☒	EM INJECTION CLAMP	TSIC-23	F.C.C	529	2023.03.17	1 year
☒	CDN (M1)	TSCDN-M1-16A	F.C.C	07004	2022.09.02	1 year
☐	CDN (M2)	TSCDN-M2-16A	F.C.C	07008	2022.09.02	1 year
☐	CDN (M2)	TSCDN-M2-16A	F.C.C	07009	2023.03.14	1 year
☒	CDN (M3)	TSCDN-M3-16A	F.C.C	07016	2023.03.14	1 year
☒	CDN (M3)	TSCDN-M3-16A	F.C.C	07017	2022.09.02	1 year

Voltage dips and Interruptions

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Compact Generator	Compact NX	EMTEST	P1725200196	2022.09.02	1 year
☒	AC Power Source	Variac NX	EMTEST	P1745207276	2022.09.02	1 year

Mains supply voltage variations

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Compact Generator	Compact NX	EMTEST	P1725200196	2022.09.02	1 year
☒	AC Power Source	Variac NX	EMTEST	P1745207276	2022.09.02	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

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

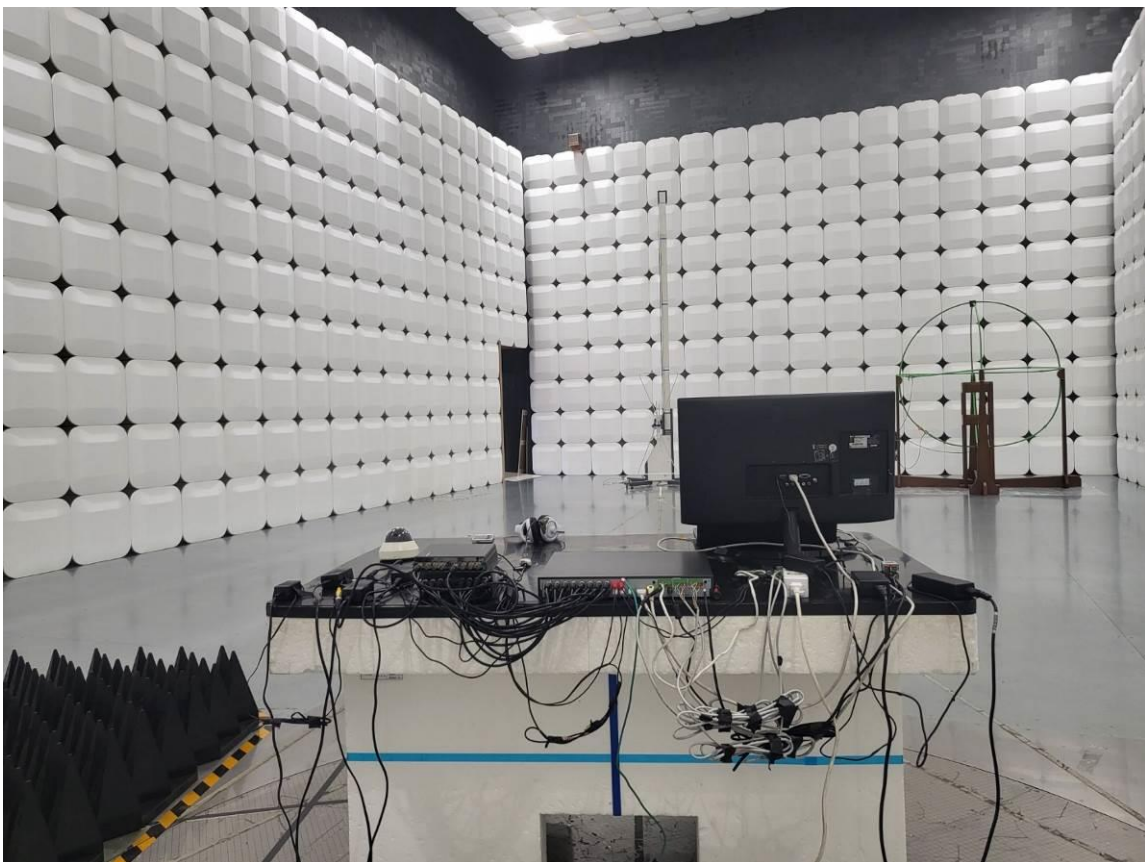
Conducted Emissions



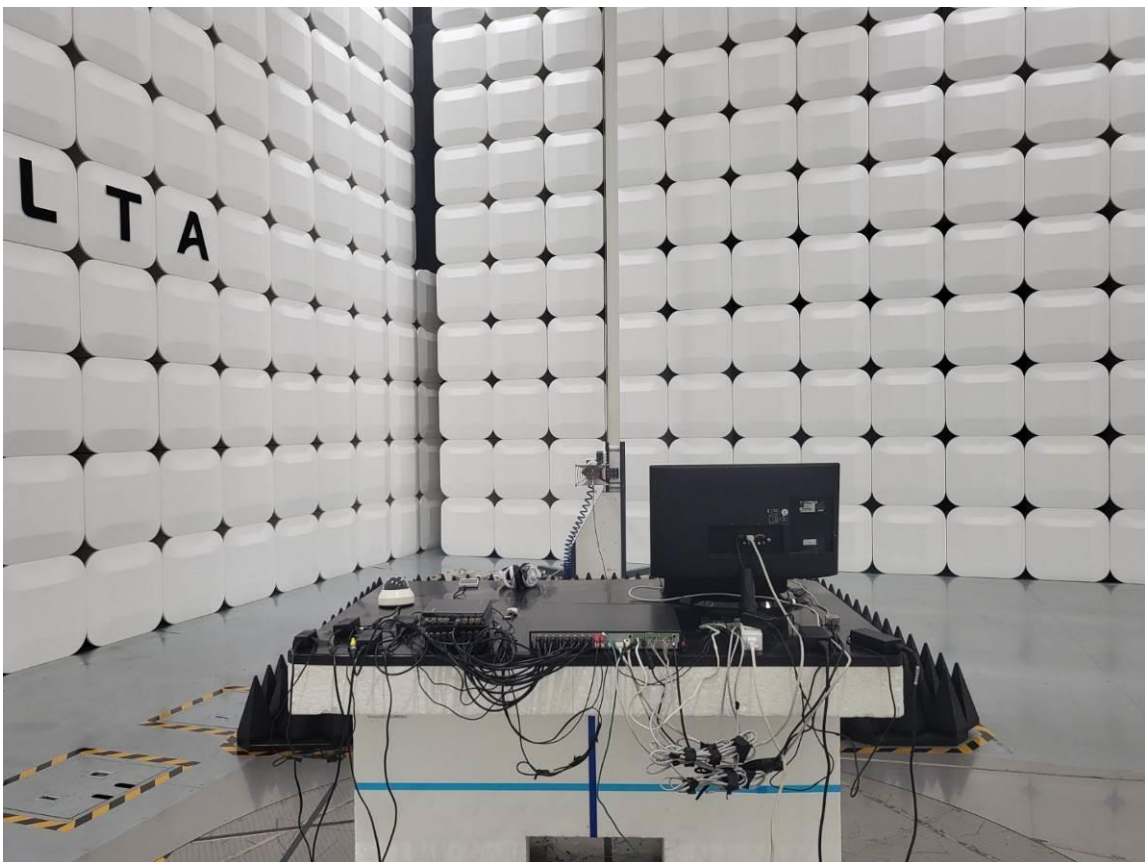
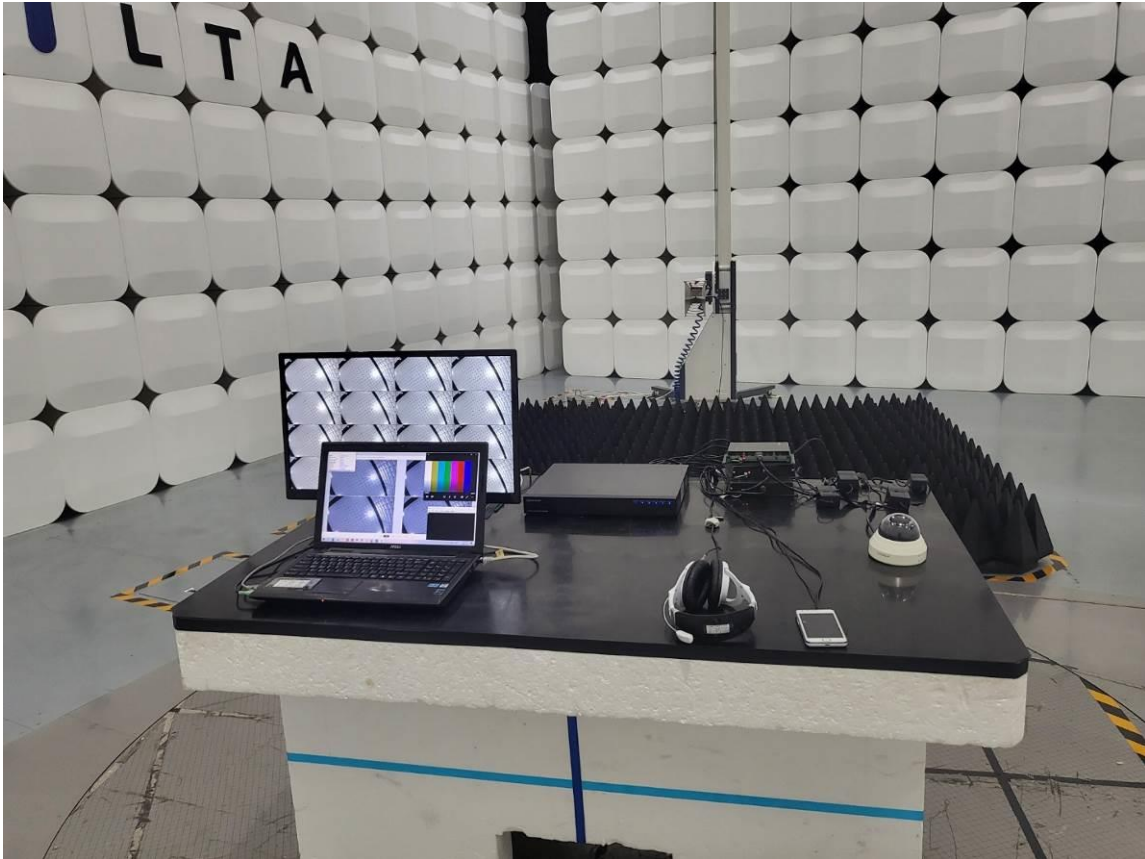
Conducted Emissions (TEL)



Radiated Emissions - Below 1 GHz



Radiated Emissions - Above 1GHz



Harmonic Current Emission / Voltage Fluctuations and Flicker



Electrostatic Discharge



RF Electromagnetic Field



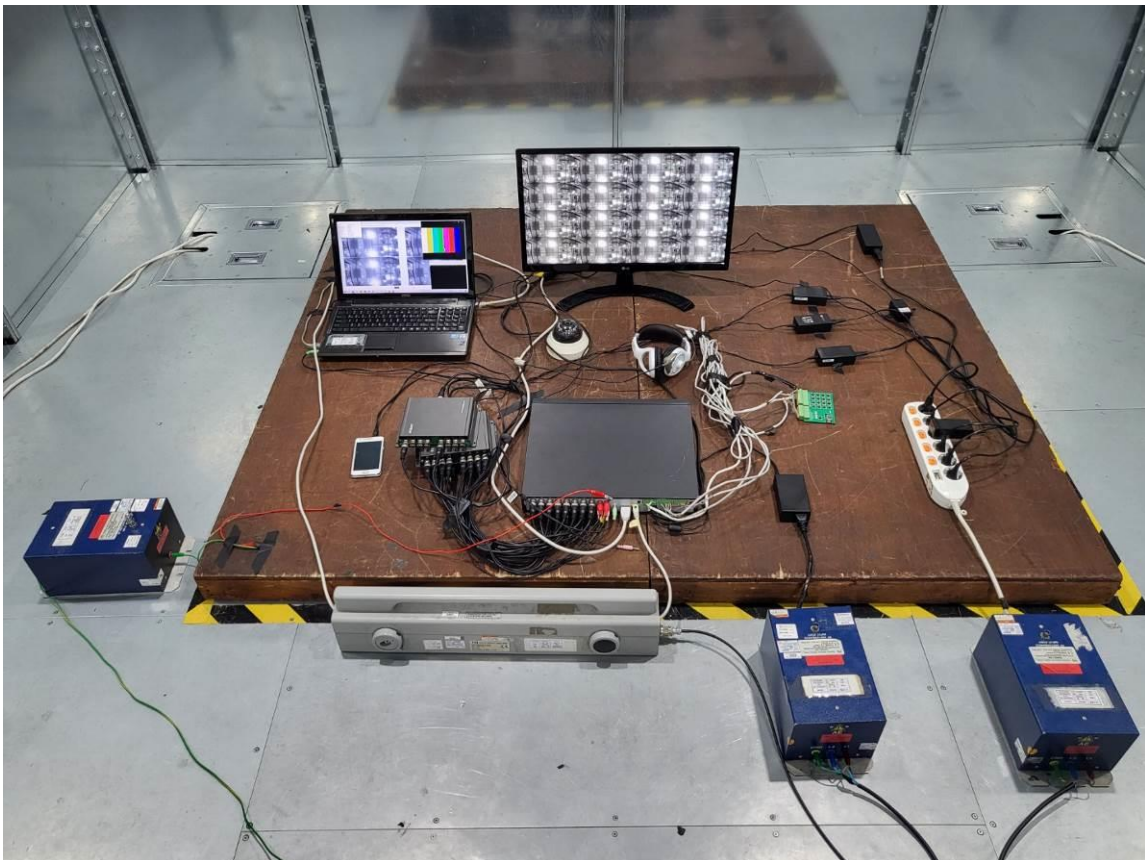
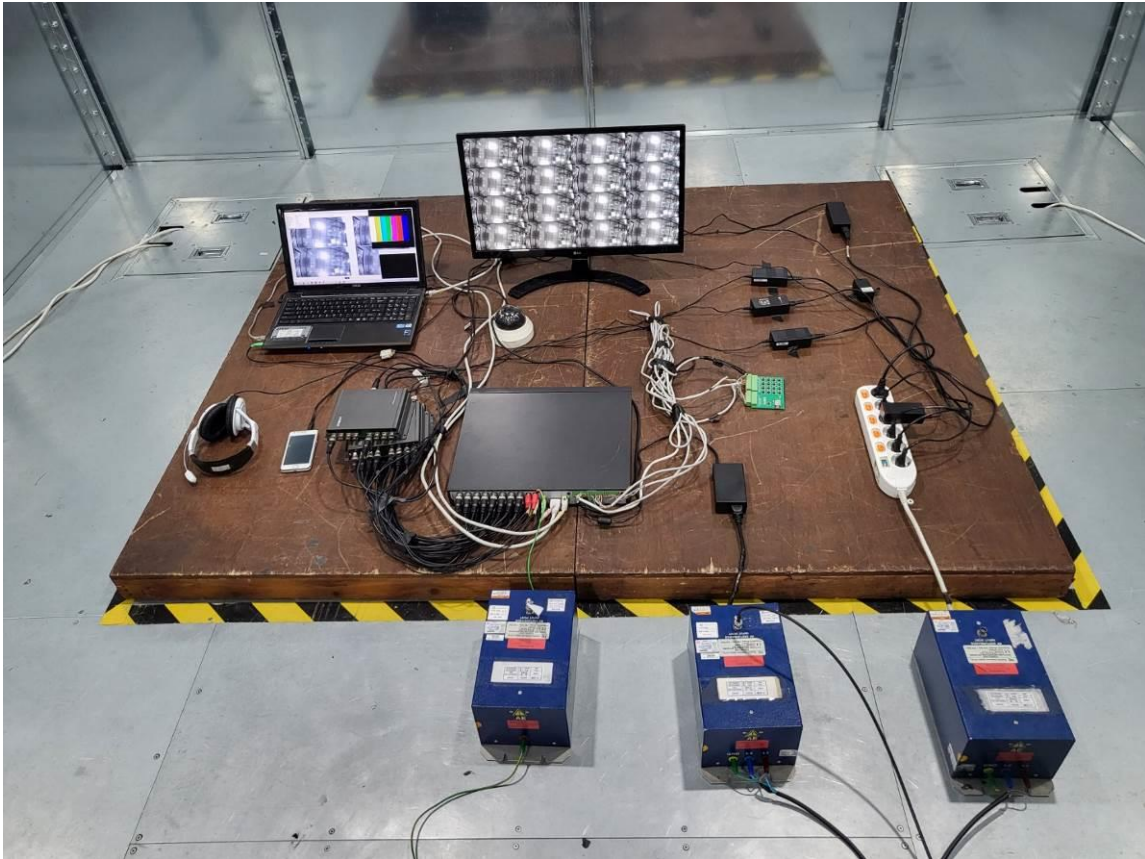
Electrical Fast Transients



Surges



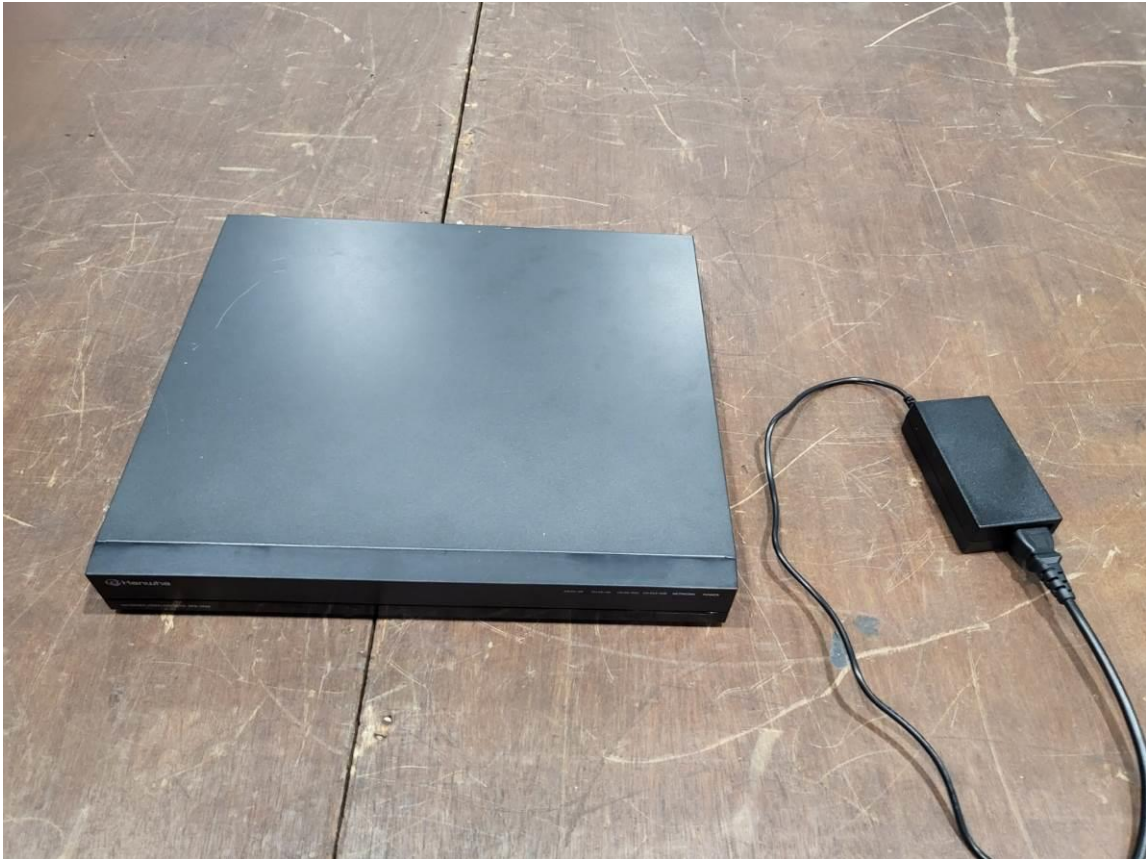
Conducted Disturbances, Induced by Radio-Frequency Fields



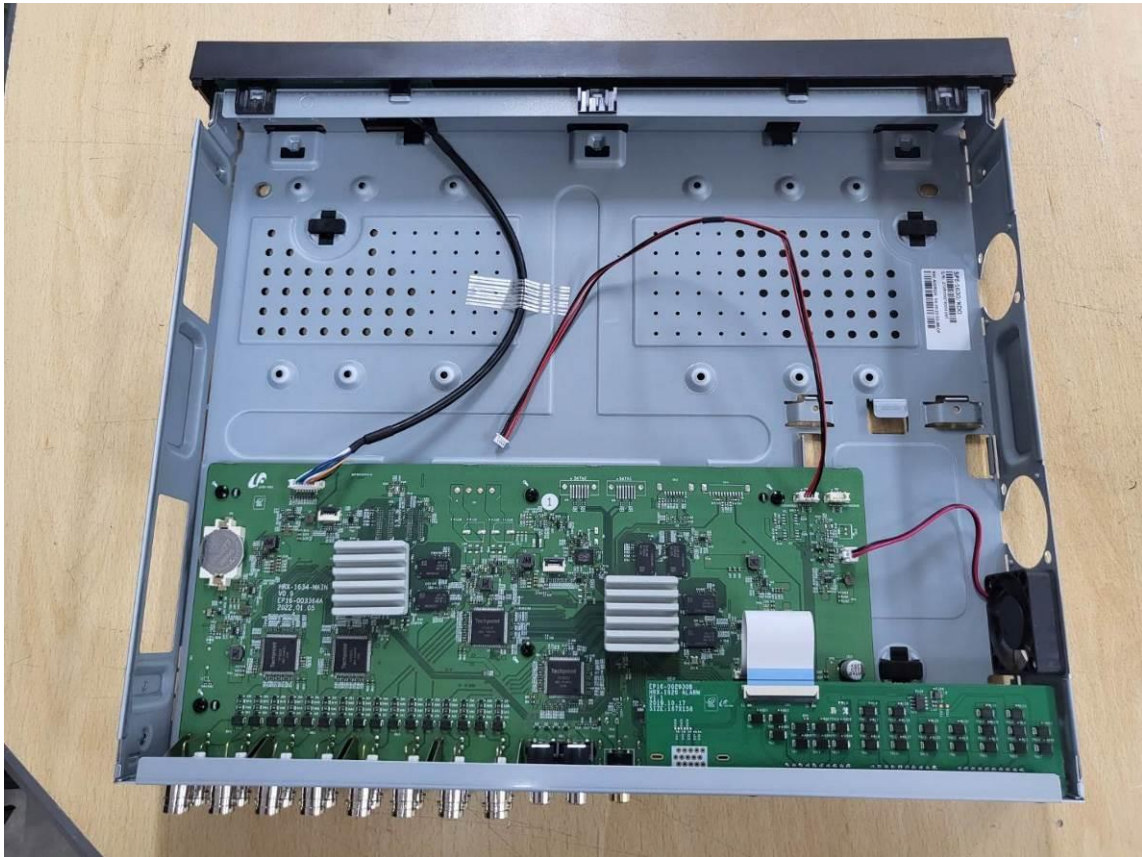
Main supply voltage (dips, variations) short interruptions



EUT



EUT



EUT _ Modification

