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EMC TEST REPORT

Dates of Tests: December 29, 2020 – January 05, 2021
Test Report S/N: LR500122101E
Test Site : LTA Co., Ltd.

Model No.

XRN-6410B2

APPLICANT

Hanwha Techwin Co., Ltd.

Equipment Name : NVR
Manufacturer : HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.
Model name : XRN-6410B2
Additional Model name : XRN-3210B2
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 : January 06, 2021

This test report is issued under the authority of:

The test was supervised by:

Young Kyu Shin, Technical Manager

Seong Jae Cheon, Tst 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.



Revision history

Revision	Date of issue	Test report No.	Description
0	06.01.2021	LR500122101E	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
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 Telephone : +82-31-323-6008
 Facsimile : +82-31-323-6010

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	2021-09-30	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
Category : NVR
Model name : XRN-6410B2
Additional Model name : XRN-3210B2
Additional Model is different number of channels.
Serial number : Identification
Date of receipt : December 21, 2020
EUT condition : Pre-production, not damaged
Interface Ports : AC IN, LAN #1, LAN #2, LAN #3, USB #1, USB #2, USB #3, USB #4, HDMI #1, HDMI #2, Audio OUT, Alarm IN / OUT, HDD Slot
Power rating : AC 230 V, 50 Hz

2-3 Modification

-NONE

2-4 Model Specification

-NONE

2-5 Test conditions

Temp. / Humid. / Pressure : (19 - 21) °C / (34 - 38) % R.H. / (100.2 – 100.5) kPa
Tested Model : XRN-6410B2
Test mode : Operating mode
Test Voltage : AC 230 V, 50 Hz

2-6 List of EUT and ACCESSORY

EUT				
Equipment Name	Model Name	Serial No.	Manufacturer	Remarks
NVR	XRN-6410B2	N/A	Hanwha Techwin Co., Ltd. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD. D-TECH CO.,LTD.	-
Mouse	MOKJUO	N/A	N/A	-
ACCESSORY				
Equipment Name	Model Name	Serial No.	Manufacturer	Remarks
Keyboard	KUB-1407	N/A	SHANGHAI RONGTENG ELECTRON TECHNOLOGICAL CO.,LTD	-
Network Camera	QNV-6083R	N/A	Hanwha Techwin Co., Ltd.	-
Poe Injector	SFC501G	N/A	N/A	-
Monitor	24BK550Y	N/A	LG Electronics Nanjing New Technology Co.,Ltd	2 EA
Smart Phone	G4	N/A	LG	-
Notebook	P56	NKW650RB 0006B02606	HANSUNG	-
HUB	SW1600-mini	N/A	IpTIME	-
Ear Phone	N/A	N/A	N/A	-
Alarm	N/A	N/A	N/A	-
USB Memory Stick	N/A	N/A	N/A	8 GB 2 EA
HDD	WD40PURX-64NN96Y0	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	HUB	LAN	3.0	NO	Plastic
	LAN #3	HUB	LAN	3.0	NO	Plastic
	USB #1	Mouse	USB	1.5	NO	Plastic
	USB #2	Keyboard	USB	1.5	NO	Plastic
	USB #3	USB Memory Stick #1	USB	-	-	-
	USB #4	USB Memory Stick #2	USB	-	-	-
	HDMI #1	Monitor #1	HDMI	1.4	YES	Plastic
	HDMI #2	Monitor #2	HDMI	1.4	YES	Plastic
	Audio OUT	Ear Phone	-	1.5	NO	Plastic
	Alarm IN / OUT	Alarm	Alarm IN / OUT	1.0	NO	Plastic
	HDD Slot	HDD	-	-	-	-
Poe Injector	LAN	Network Camera	LAN	3.0	NO	Plastic
	AC IN	AC Power Source	3 Pin AC Line	1.2	NO	Plastic
HUB	LAN	Notebook	LAN	1.0	NO	Plastic
	AC IN	AC Power Source	3 Pin AC Line	1.6	NO	Plastic
Network Camera	Audio IN	Smart Phone	-	1.4	NO	Plastic
Notebook	DC IN	Battery	DC OUT	-	-	-
Monitor #1	AC IN	AC Power Source	3 Pin AC Line	1.5	NO	Plastic
Monitor #2	AC IN	AC Power Source	3 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/AC:2016-07	C
Radiated Emissions	EN 55032:2015/AC:2016-07	C
Harmonic Current Emission	EN 61000-3-2:2014	NA ^{Note 3}
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.

Note 3: We did not test EN61000-3-2 (Harmonic current emissions) for the XRN-6410B2 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/AC:2016-07
Measurement RBW	: 9 kHz
Test mode	: Operating 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.

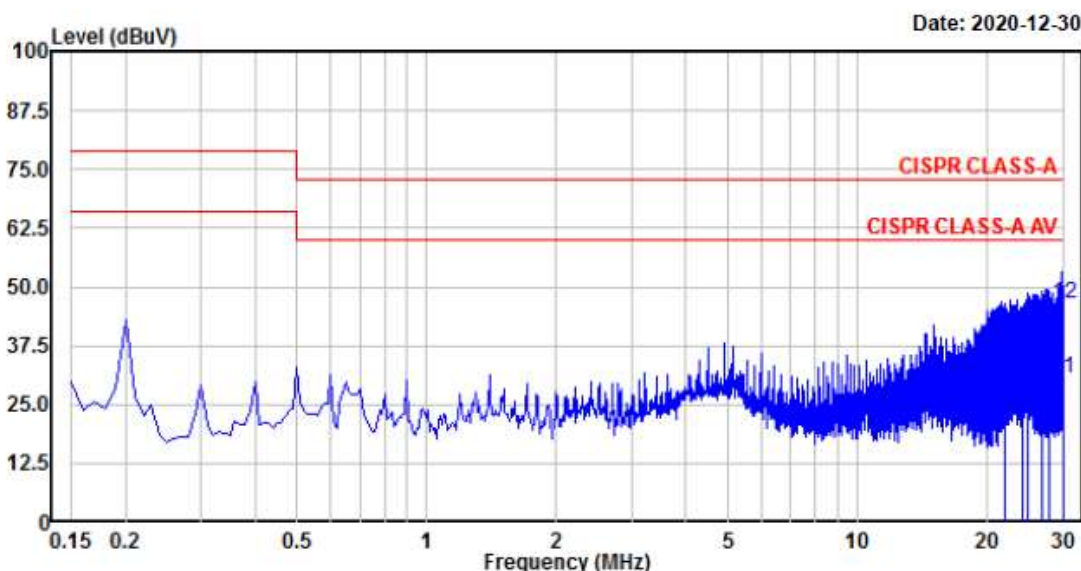
Note 2: The current and voltage disturbance limits are derived for use with an impedance stabilization network (ISN) which presents a common mode (asymmetric mode) impedance of 150 Ω to the telecommunication port under test (conversion factor is $20 \log_{10} 150/I = 44$ dB)

Conducted Emissions (LINE)



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EUT /Model No. : XRN-6410B2	Phase : Line
Test Mode : Operating mode	Test Power : 230 V / 50 Hz
Temp./ Humi. : 21 'C / 38 % R.H.	Test Engineer : CHEON S J



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.	22.020	19.88	4.47	20.01	39.89	24.48	73.00	60.00	33.11	35.52	Line
4.	24.183	20.83	6.43	20.05	40.88	26.48	73.00	60.00	32.12	33.52	Line
6.	24.909	21.54	5.08	20.04	41.58	25.12	73.00	60.00	31.42	34.88	Line
8.	26.858	20.65	3.76	20.08	40.73	23.84	73.00	60.00	32.27	36.16	Line
10.	27.973	21.22	4.53	20.09	41.31	24.62	73.00	60.00	31.69	35.38	Line
12.	29.990	26.20	10.46	20.13	46.33	30.59	73.00	60.00	26.67	29.41	Line

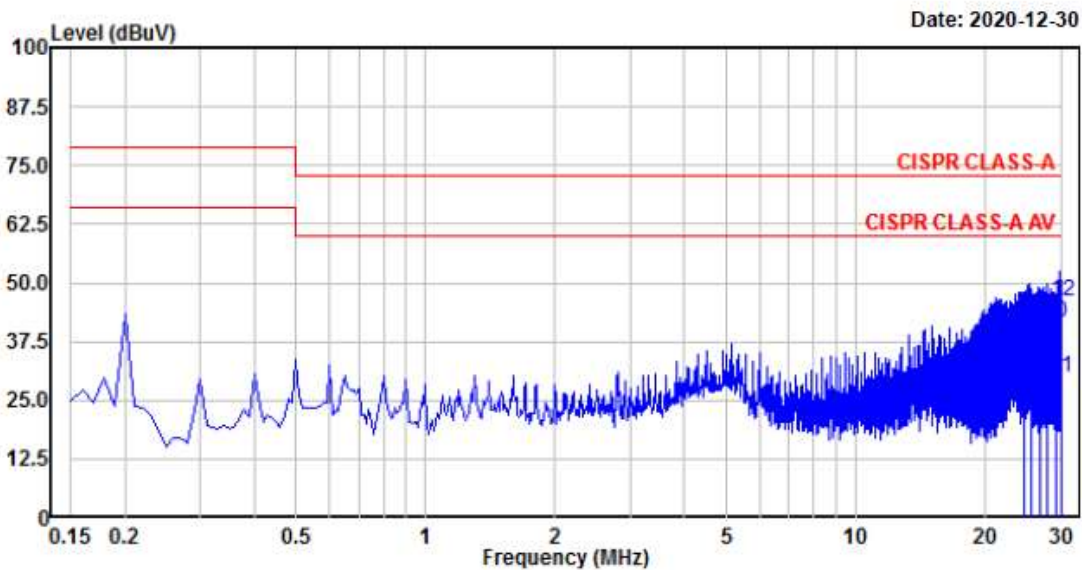
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

Conducted Emissions (NEUTRAL)



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EUT /Model No. : XRN-6410B2	Phase : Neutral
Test Mode : Operating mode	Test Power : 230 V / 50 Hz
Temp./ Humi. : 21 'C / 38 % R.H.	Test Engineer : CHEON S J



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.	24.527	20.03	5.88	20.11	40.14	25.99	73.00	60.00	32.86	34.01	neutral
4.	25.601	21.33	6.99	20.13	41.46	27.12	73.00	60.00	31.54	32.88	neutral
6.	26.862	21.59	4.31	20.16	41.75	24.47	73.00	60.00	31.25	35.53	neutral
8.	27.869	21.95	5.39	20.17	42.12	25.56	73.00	60.00	30.88	34.44	neutral
10.	29.070	21.28	6.35	20.20	41.48	26.55	73.00	60.00	31.52	33.45	neutral
12.	29.966	25.66	9.53	20.22	45.88	29.75	73.00	60.00	27.12	30.25	neutral

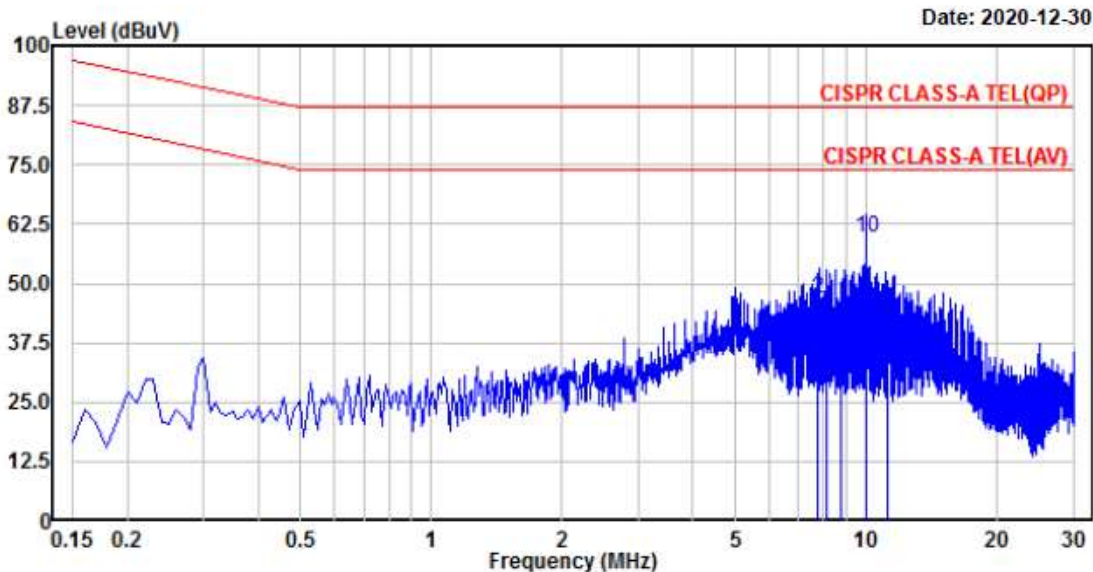
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

Conducted Emissions (TEL_10 M) / Operating mode LAN #1



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EUT /Model No. : XRN-6410B2	Phase : TEL_10M #1
Test Mode : Operating mode	Test Power : 230 V / 50 Hz
Temp./ Humi. : 21 'C / 38 % R.H.	Test Engineer : CHEON S J



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.	7.742	27.50	10.25	19.32	46.82	29.57	87.00	74.00	40.18	44.43	Line
4.	8.152	23.79	8.77	19.33	43.12	28.10	87.00	74.00	43.88	45.90	Line
6.	8.721	21.18	9.21	19.34	40.52	28.55	87.00	74.00	46.48	45.45	Line
8.	8.749	21.97	8.79	19.34	41.31	28.13	87.00	74.00	45.69	45.87	Line
10.	10.000	40.39	16.27	19.37	59.76	35.64	87.00	74.00	27.24	38.36	Line
12.	11.250	21.32	8.75	19.41	40.73	28.16	87.00	74.00	46.27	45.84	Line

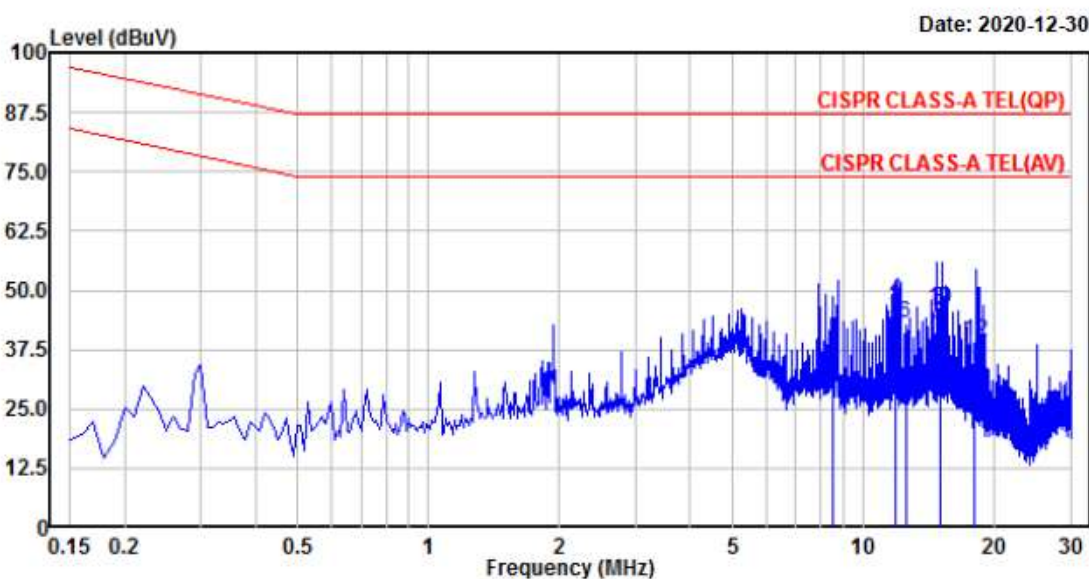
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

Conducted Emissions (TEL_100 M) / Operating mode LAN #1



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EUT /Model No. : XRN-6410B2	Phase : TEL_100M #1
Test Mode : Operating mode	Test Power : 230 V / 50 Hz
Temp./ Humi. : 21 'C / 38 % R.H.	Test Engineer : CHEON S J



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.	8.532	16.87	8.01	19.17	36.04	27.18	87.00	74.00	50.96	46.82	Line
4.	11.898	28.50	27.12	19.25	47.75	46.37	87.00	74.00	39.25	27.63	Line
6.	12.499	23.70	9.28	19.26	42.96	28.54	87.00	74.00	44.04	45.46	Line
8.	14.969	26.82	23.31	19.32	46.14	42.63	87.00	74.00	40.86	31.37	Line
10.	14.971	26.84	23.44	19.32	46.16	42.76	87.00	74.00	40.84	31.24	Line
12.	17.964	19.78	14.86	19.42	39.20	34.28	87.00	74.00	47.80	39.72	Line

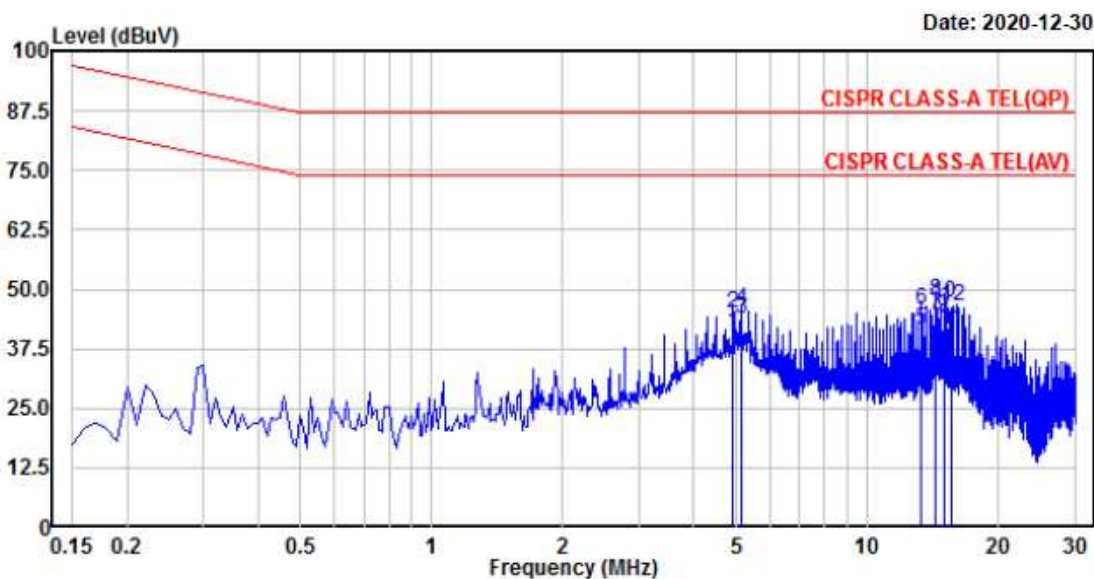
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

Conducted Emissions (TEL_1000 M) / Operating mode LAN #1



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EUT /Model No. : XRN-6410B2	Phase : TEL_1000M #1
Test Mode : Operating mode	Test Power : 230 V / 50 Hz
Temp./ Humi. : 21 'C / 38 % R.H.	Test Engineer : CHEON S J



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.	4.920	25.56	21.41	19.23	44.79	40.64	87.00	74.00	42.21	33.36	Line
4.	5.133	26.26	24.37	19.23	45.49	43.60	87.00	74.00	41.51	30.40	Line
6.	13.259	26.13	21.96	19.40	45.53	41.36	87.00	74.00	41.47	32.64	Line
8.	14.330	27.94	25.01	19.43	47.37	44.44	87.00	74.00	39.63	29.56	Line
10.	14.970	27.66	24.59	19.44	47.10	44.03	87.00	74.00	39.90	29.97	Line
12.	15.614	27.10	22.15	19.45	46.55	41.60	87.00	74.00	40.45	32.40	Line

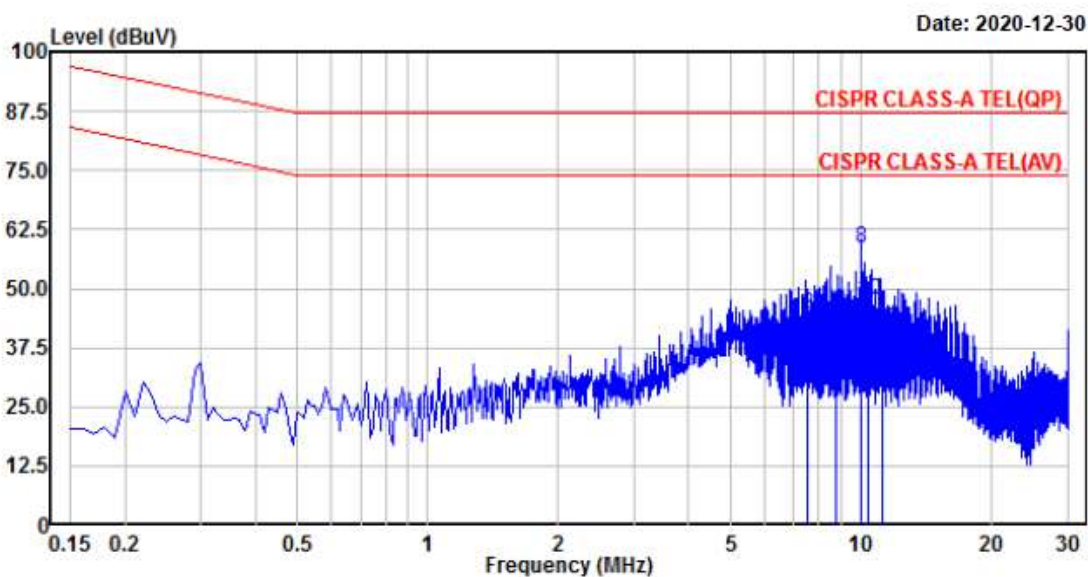
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

Conducted Emissions (TEL_10 M) / Operating mode LAN #2



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EUT /Model No. : XRN-6410B2	Phase : TEL_10M #2
Test Mode : Operating mode	Test Power : 230 V / 50 Hz
Temp./ Humi. : 21 'C / 38 % R.H.	Test Engineer : CHEON S J



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.	7.498	25.33	9.23	19.31	44.64	28.54	87.00	74.00	42.36	45.46	Line
4.	8.749	21.64	8.70	19.34	40.98	28.04	87.00	74.00	46.02	45.96	Line
6.	8.750	22.01	8.54	19.34	41.35	27.88	87.00	74.00	45.65	46.12	Line
8.	10.000	39.20	15.57	19.37	58.57	34.94	87.00	74.00	28.43	39.06	Line
10.	10.382	28.17	11.05	19.38	47.55	30.43	87.00	74.00	39.45	43.57	Line
12.	11.250	21.86	8.93	19.41	41.27	28.34	87.00	74.00	45.73	45.66	Line

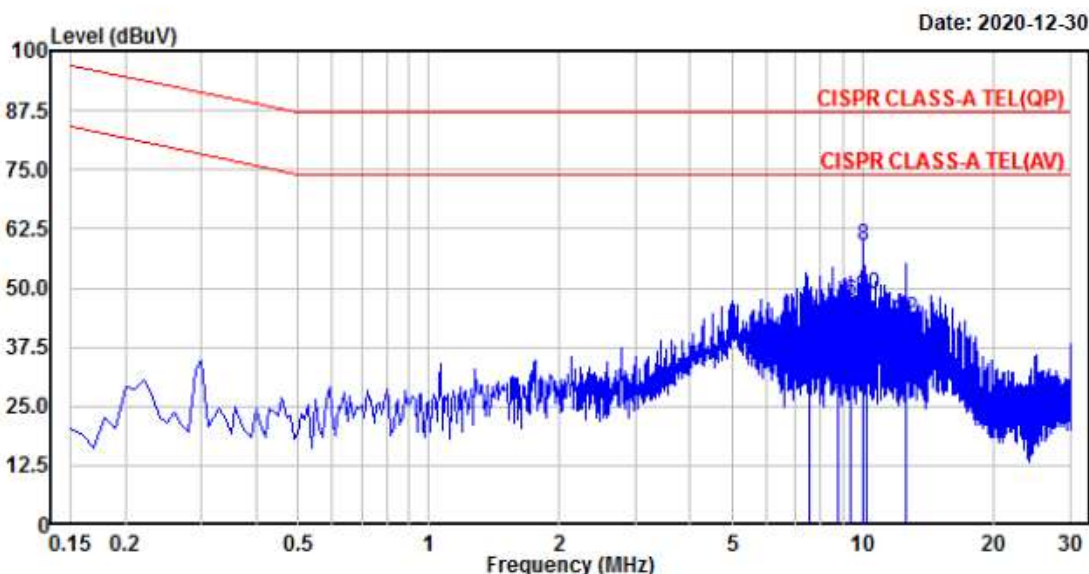
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

Conducted Emissions (TEL_100 M) / Operating mode LAN #2



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EUT /Model No. : XRN-6410B2	Phase : TEL_100M #2
Test Mode : Operating mode	Test Power : 230 V / 50 Hz
Temp./ Humi. : 21 °C / 38 % R.H.	Test Engineer : CHEON S J



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.	7.498	24.80	8.92	19.15	43.95	28.07	87.00	74.00	43.05	45.93	Line
4.	8.748	21.89	8.53	19.17	41.06	27.70	87.00	74.00	45.94	46.30	Line
6.	9.377	27.85	11.33	19.18	47.03	30.51	87.00	74.00	39.97	43.49	Line
8.	10.000	39.59	15.64	19.20	58.79	34.84	87.00	74.00	28.21	39.16	Line
10.	10.186	29.65	11.97	19.20	48.85	31.17	87.00	74.00	38.15	42.83	Line
12.	12.499	24.16	9.47	19.26	43.42	28.73	87.00	74.00	43.58	45.27	Line

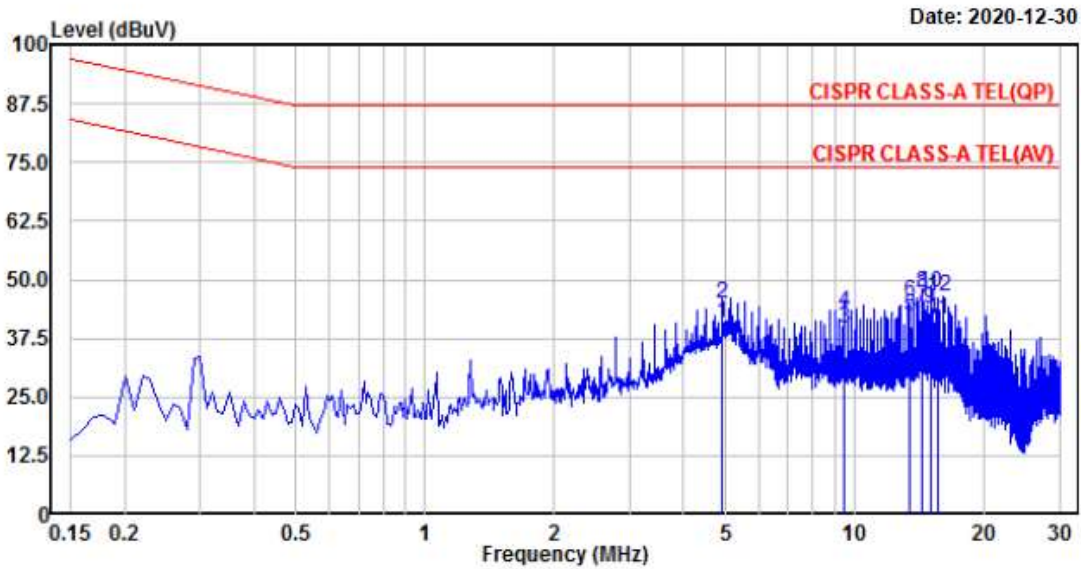
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

Conducted Emissions (TEL_1000 M) / Operating mode LAN #2



4, Songjuro 236 Beon-gil, Yangji-myeon
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EUT /Model No. : XRN-6410B2	Phase : TEL_1000M #2
Test Mode : Operating mode	Test Power : 230 V / 50 Hz
Temp./ Humi. : 21 'C / 38 % R.H.	Test Engineer : CHEON S J



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.	4.920	25.54	21.47	19.23	44.77	40.70	87.00	74.00	42.23	33.30	Line
4.	9.410	23.59	20.39	19.32	42.91	39.71	87.00	74.00	44.09	34.29	Line
6.	13.476	26.03	22.81	19.41	45.44	42.22	87.00	74.00	41.56	31.78	Line
8.	14.330	27.66	24.65	19.43	47.09	44.08	87.00	74.00	39.91	29.92	Line
10.	14.971	27.62	24.43	19.44	47.06	43.87	87.00	74.00	39.94	30.13	Line
12.	15.612	27.02	22.12	19.45	46.47	41.57	87.00	74.00	40.53	32.43	Line

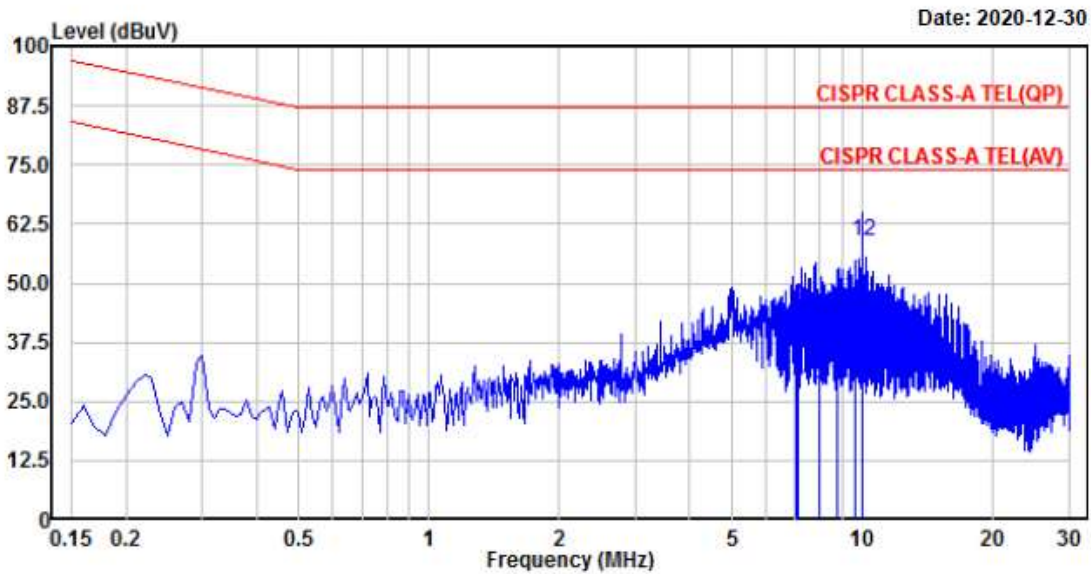
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

Conducted Emissions (TEL_10 M) / Operating mode LAN #3



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EUT /Model No. : XRN-6410B2	Phase : TEL_10M #3
Test Mode : Operating mode	Test Power : 230 V / 50 Hz
Temp./ Humi. : 21 °C / 38 % R.H.	Test Engineer : CHRON S J



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.	7.062	20.91	11.13	19.31	40.22	30.44	87.00	74.00	46.78	43.56	Line
4.	7.118	25.87	9.76	19.31	45.18	29.07	87.00	74.00	41.82	44.93	Line
6.	7.960	22.16	9.22	19.33	41.49	28.55	87.00	74.00	45.51	45.45	Line
8.	8.749	23.01	8.72	19.34	42.35	28.06	87.00	74.00	44.65	45.94	Line
10.	9.621	27.70	20.76	19.37	47.07	40.13	87.00	74.00	39.93	33.87	Line
12.	10.000	39.42	15.69	19.37	58.79	35.06	87.00	74.00	28.21	38.94	Line

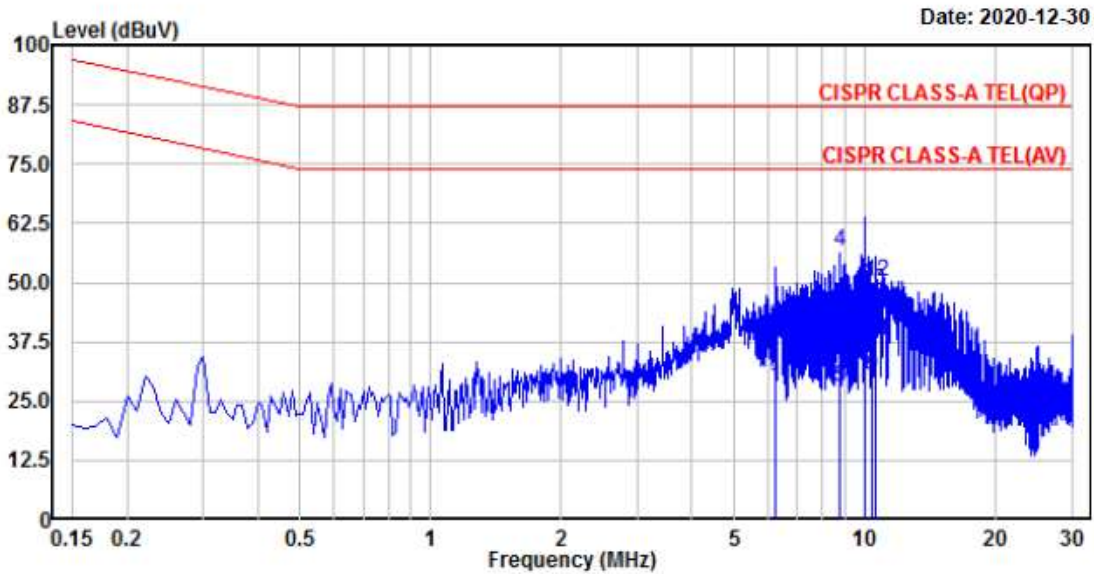
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

Conducted Emissions (TEL_100 M) / Operating mode LAN #3



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EUT /Model No. : XRN-6410B2	Phase : TEL_100M #3
Test Mode : Operating mode	Test Power : 230 V / 50 Hz
Temp./ Humi. : 21 'C / 38 % R.H.	Test Engineer : CHEON S J



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.	6.249	21.46	8.75	19.12	40.58	27.87	87.00	74.00	46.42	46.13	Line
4.	8.748	37.31	8.60	19.17	56.48	27.77	87.00	74.00	30.52	46.23	Line
6.	8.749	22.83	8.93	19.17	42.00	28.10	87.00	74.00	45.00	45.90	Line
8.	10.000	29.80	14.20	19.20	49.00	33.40	87.00	74.00	38.00	40.60	Line
10.	10.381	28.94	10.91	19.21	48.15	30.12	87.00	74.00	38.85	43.88	Line
12.	10.620	30.80	18.50	19.21	50.01	37.71	87.00	74.00	36.99	36.29	Line

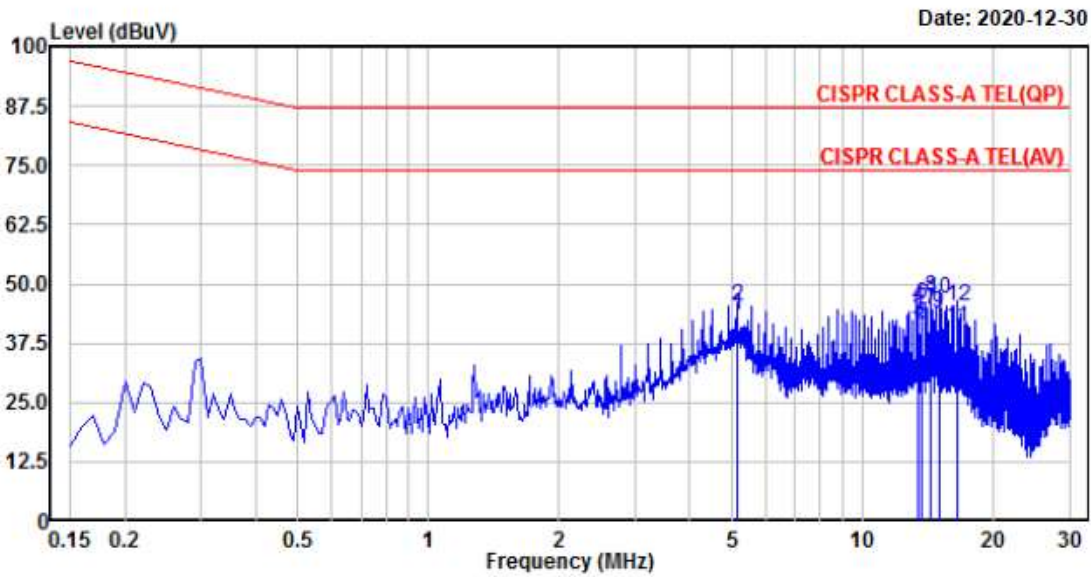
Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

Conducted Emissions (TEL_1000 M) / Operating mode LAN #3



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EUT /Model No. : XRN-6410B2	Phase : TEL_1000M #3
Test Mode : Operating mode	Test Power : 230 V / 50 Hz
Temp./ Humi. : 21 'C / 38 % R.H.	Test Engineer : CHEON S J



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.	5.134	26.12	24.22	19.23	45.35	43.45	87.00	74.00	41.65	30.55	Line
4.	13.475	26.00	22.86	19.41	45.41	42.27	87.00	74.00	41.59	31.73	Line
6.	13.686	26.16	22.13	19.42	45.58	41.55	87.00	74.00	41.42	32.45	Line
8.	14.329	27.82	25.08	19.43	47.25	44.51	87.00	74.00	39.75	29.49	Line
10.	14.971	27.53	24.42	19.44	46.97	43.86	87.00	74.00	40.03	30.14	Line
12.	16.469	25.79	21.35	19.48	45.27	40.83	87.00	74.00	41.73	33.17	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	: Operating 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 : higher than 108 MHz)

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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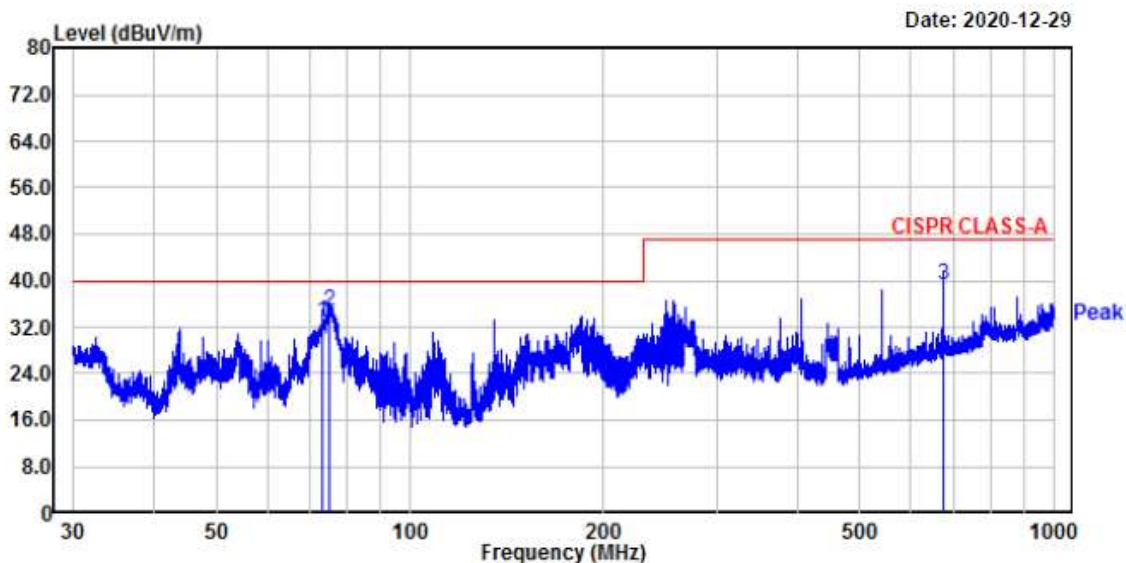
EUT/Model No.: XRN-6410B2

Temp/Humi: 20 'C / 34 % R.H.

Test Mode : Operating mode

Tested by: CHEON S J

Power : 230 V / 50 Hz



Date: 2020-12-29

No.	Freq MHz	Reading dBμV	C.F dB	Result QP dBμV/m	Limit dBμV/m	Margin dB	Height cm	Angle deg	Polarity
1.	73.07	49.50	-16.61	32.89	40.00	7.11	100	312	vertical
2.	75.12	51.59	-16.98	34.61	40.00	5.39	118	300	vertical
3.	675.21	42.60	-3.22	39.38	47.00	7.62	338	244	vertical

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

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	:	Operating mode
Rated power	:	26.407 W
Result	:	Not Applicable

Measurement Data:

- We did not test EN61000-3-2 (Harmonic Current Emission) for the XRN-6410B2 because equipment whose rated power is less or equal 75 W don't need to be tested.

Harmonic Current Emission

27th December 2020 - 10:05:08		Page 1/1	IECSoft v2_6
	IEC61000-3-2:2014		
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	XRN-6410B2		
Serial	N/A		
Impedance Network ID	N/A		
Test Conditions			
	User Entered	Measured	
Rated Voltage	N/A	230.836V	
Rated Current	N/A	309.731mA	
Rated Frequency	N/A	50.000Hz	
Rated Power	N/A	26.407W	
Additional Test Information			
Measured Power Factor	0.3693		
Max Current THD	142.65%		
Average THC	203.185mA		
Max Power	30.801W		
Max F.Current	164.786mA		
Average F.Current	147.690mA		
Minimum Current	100A		
Test Duration	2.5 minutes		
Additional Test Details			
Operator	N/A		
Lab Name	N/A		
Location	N/A		
Notes			
Signature			
Results	Test - N/A. Invalid DUT		

Test not applicable

With the exception of lighting equipment section 7 of the IEC61000-3-2:2014 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



Test mode : Operating mode

Result : **Complies**

Measurement Data:

- Refer to the Next page

Voltage Fluctuations and Flicker

27th December 2020 - 13:15:27		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	XRN-6410B2				
Serial	N/A				
Impedance Network ID	N/A				
Test Conditions					
	User Entered		Measured		
Rated Voltage	N/A		230.836V		
Rated Current	N/A		N/A		
Rated Frequency	N/A		50.000Hz		
Rated Power	N/A		N/A		
D max	0.1224% (Limit: 4.0%)				
T max	0.0000 s (Limit: 0.5 s)				
DC max	0.0505% (Limit: 3.3%)				
Additional Test Details					
Operator	N/A				
Lab Name	N/A				
Location	N/A				
Notes					
Signature					
Results	Phase1: PASS				

27th December 2020 - 13:15:27		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	XRN-6410B2							
Serial	N/A							
Flicker Test Results								
PST no.	Status	DC (%)	Dmax (%)	Tmax (s)	PST	PST Lim	PLT	PLT Lim
1	Phase1: PASS	0.05047	0.11439	0.00000	0.09487	1.00000	0.09487	N/A
2	Phase1: PASS	0.05047	0.11439	0.00000	0.09678	1.00000	0.09584	N/A
3	Phase1: PASS	0.05047	0.11509	0.00000	0.09584	1.00000	0.09584	N/A
4	Phase1: PASS	0.05047	0.11509	0.00000	0.09598	1.00000	0.09587	N/A
5	Phase1: PASS	0.05047	0.12239	0.00000	0.09522	1.00000	0.09574	N/A
6	Phase1: PASS	0.05047	0.12239	0.00000	0.09584	1.00000	0.09576	N/A
7	Phase1: PASS	0.05047	0.12239	0.00000	0.09917	1.00000	0.09626	N/A
8	Phase1: PASS	0.05047	0.12239	0.00000	0.09677	1.00000	0.09633	N/A
9	Phase1: PASS	0.05047	0.12239	0.00000	0.09480	1.00000	0.09616	N/A
10	Phase1: PASS	0.05047	0.12239	0.00000	0.09471	1.00000	0.09602	N/A
11	Phase1: PASS	0.05047	0.12239	0.00000	0.09432	1.00000	0.09586	N/A
12	Phase1: PASS	0.05047	0.12239	0.00000	0.09995	1.00000	0.09622	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. 12. 30.
Test method	:	EN 61000-4-2 :2009
Temperature / Humidity / Pressure	:	20 °C / 37 % R.H. / 100.3 kPa
Discharge Impedance	:	(330 ± 10 %) Ω / (150 ± 10 %) pF
Type of Discharge (air discharge)	:	±2 kV, ±4 kV, ±8 kV
Type of Discharge (contact discharge)	:	±6 kV
Number of discharges at each point	:	10 of each polarity
Discharge Repetition on Rate	:	1 / sec
Test mode	:	Operating mode
Result	:	Complies

Measurement Data:
ESD Test Point and Result
1-1. Indirect Discharge

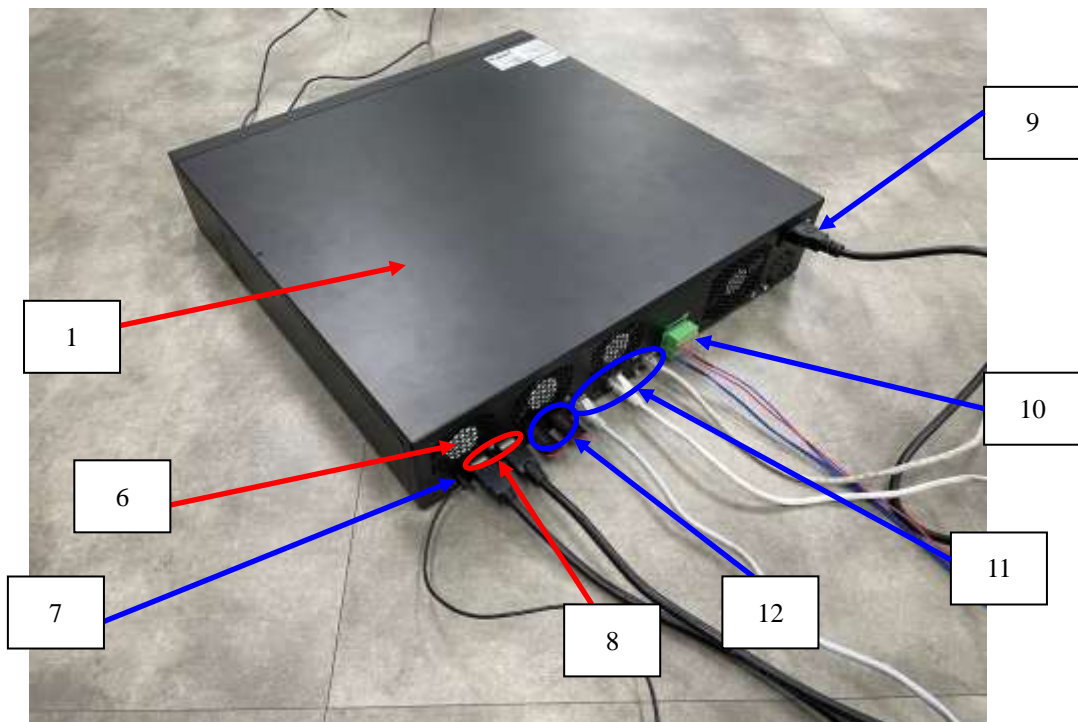
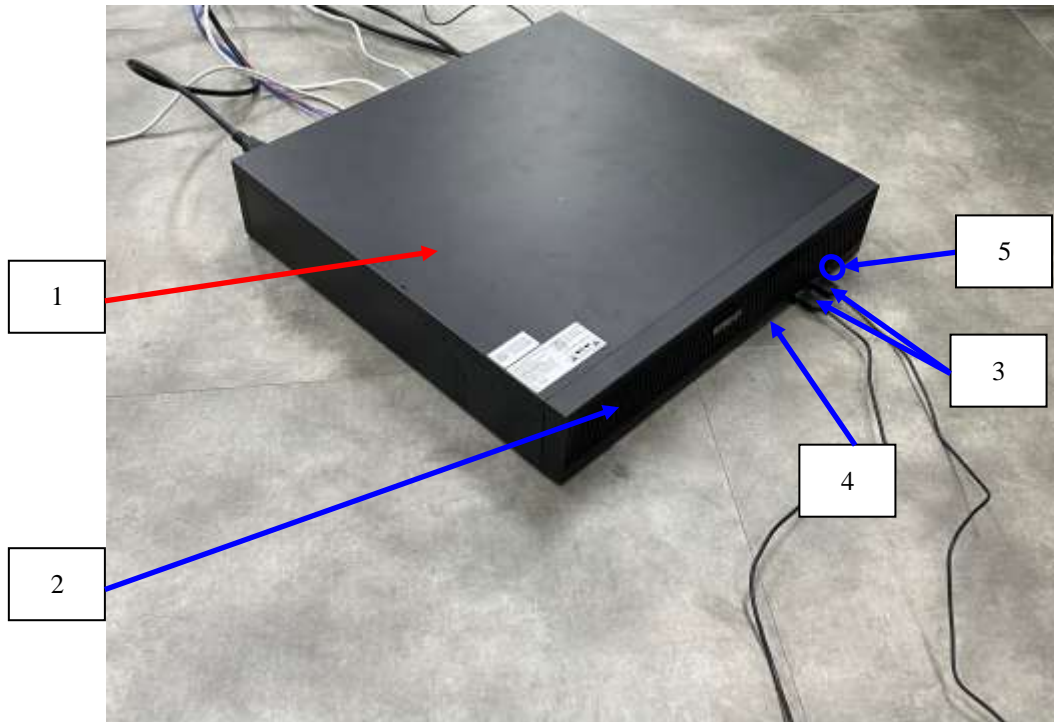
No.	Position	Kind of Discharge	Results	Remarks
1	HCP	Contact	Complies	No reaction recognized
2	VCP	Contact	Complies	No reaction recognized

1-2. Direct Discharge

No.	Position	Kind of Discharge	Result	Remarks
1	Enclosure #1	Contact	Complies	No reaction recognized
2	Enclosure #2	Air	Complies	No reaction recognized
3	USB	Air	Complies	No reaction recognized
4	LED	Air	Complies	No reaction recognized
5	ON/OFF Button	Air	Complies	No reaction recognized
6	FAN	Contact	Complies	No reaction recognized
7	Audio OUT	Air	Complies	No reaction recognized
8	HDMI	Contact	Complies	No reaction recognized
9	AC IN	Air	Complies	No reaction recognized
10	Alarm IN / OUT	Air	Complies	No reaction recognized
11	LAN	Air	Complies	No reaction recognized
12	USB Memory Stick	Air	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	:	2021. 01. 05.
Test method	:	EN 61000-4-3:2006/A1:2008/A2:2010
Temperature / Humidity / Pressure	:	21 °C / 38 % R.H. / 100.5 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	:	Operating 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. 12. 31.
Test method	:	EN 61000-4-4:2012
Temperature / Humidity / Pressure	:	20 °C / 38 % R.H. / 100.3 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	:	Operating 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
Audio OUT	±1 kV	Complies	No reaction recognized
Alarm IN	±1 kV	Complies	No reaction recognized
Alarm 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	:	2020. 12. 31.
Test method	:	EN 61000-4-5:2014/A1:2017
Temperature / Humidity / Pressure	:	21 °C / 37 % R.H. / 100.3 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	:	Operating mode
Result	:	Complies

- Refer to the Next page

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
Audio OUT	±(0.5, 1.0) kV	Complies	No reaction recognized
Alarm IN	±(0.5, 1.0) kV	Complies	No reaction recognized
Alarm OUT	±(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	:	2021. 01. 04.
Test method	:	EN 61000-4-6:2014/AC:2015
Temperature / Humidity / Pressure	:	21 °C / 35 % R.H. / 100.3 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	:	Operating 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
Audio OUT	Complies	No reaction recognized
Alarm IN	Complies	No reaction recognized
Alarm 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	:	2020. 12. 31.
Test method	:	EN 61000-4-11:2004/A1:2017
Temperature / Humidity / Pressure	:	19 °C / 38 % R.H. / 100.2 kPa
Ut	:	230 Vac
Test mode	:	Operating 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 about 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	:	2020. 12. 31.
Test method	:	EN 61000-4-11:2004/A1:2017
Temperature / Humidity / Pressure	:	19 °C / 38 % R.H. / 100.2 kPa
Supply Voltage maximum	:	$U_{nom} + 10 \%$
Supply Voltage minimum	:	$U_{nom} - 15 \%$
Ut	:	230 Vac
Test mode	:	Operating 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
Unom	+10%	253	Complies	No reaction recognized
Unom	-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
<input checked="" type="checkbox"/>	EMI TEST Receiver	ESR	Rohde & Schwarz	101499	2021.07.02	1 year
<input checked="" type="checkbox"/>	Pulse Limiter	ESH3-Z2	Rohde & Schwarz	100710	2021.03.16	1 year
<input checked="" type="checkbox"/>	ISN	ISN T800	TESEQ	27109	2021.09.07	1 year
<input checked="" type="checkbox"/>	ISN	ENY81-CA6	Rohde & Schwarz	101565	2021.09.07	1 year
<input type="checkbox"/>	ISN	ISN S8	Schwarzbeck	79	2021.09.04	1 year
<input type="checkbox"/>	CURRENT PROBE	EZ-17	Rohde & Schwarz	100508	2021.09.03	1 year
<input type="checkbox"/>	CDN	TSCDN-C1-BNC-75	F.C.C	07004	2021.05.08	1 year
<input type="checkbox"/>	LISN	ESH3-Z6	Rohde & Schwarz	100378	2021.09.03	1 year
<input type="checkbox"/>	LISN	ESH3-Z6	Rohde & Schwarz	101468	2021.09.03	1 year
<input checked="" type="checkbox"/>	LISN(main)	ENV216	Rohde & Schwarz	100408	2021.09.04	1 year
<input checked="" type="checkbox"/>	LISN(sub)	LT32C/10	AFJ	32031518210	2021.09.03	1 year
<input checked="" type="checkbox"/>	TEST PROGRAM	e3_ce 20181212a (V9)	AUDIX	-	-	-

Radiated Emissions – Below 1 GHz

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
<input checked="" type="checkbox"/>	EMI TEST Receiver	ESU	Rohde & Schwarz	100092	2021.09.03	1 year
<input checked="" type="checkbox"/>	Amplifier (25 dB)	8447D	HP	2944A07684	2021.11.10	1 year
<input checked="" type="checkbox"/>	BILOG Antenna	VULB 9168	SCHWARZBECK	775	2021.03.26 (KOLAS)	2 year
<input type="checkbox"/>	BILOG Antenna	VULB 9168	SCHWARZBECK	775	2021.11.12 (RRA)	2 year
<input checked="" type="checkbox"/>	TEST PROGRAM	e3 20181212a (V9)	AUDIX	-	-	-

Radiated Emissions – Above 1 GHz

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
<input checked="" type="checkbox"/>	EMI TEST Receiver	ESU	Rohde & Schwarz	100092	2021.09.03	1 year
<input checked="" type="checkbox"/>	Amplifier	8449B	Agilent	3008A02126	2021.03.17	1 year
<input type="checkbox"/>	Amplifier	PAM-840A	COM-POWER	461314	2021.03.16	1 year
<input type="checkbox"/>	HORN ANTENNA	3116B	ETS	133350	2022.05.12	2 year
<input type="checkbox"/>	HORN ANTENNA	3116B	ETS	81109	2022.05.12	2 year
<input checked="" type="checkbox"/>	HORN ANTENNA	3115	ETS	114105	2021.09.17 (KOLAS)	2 year
<input type="checkbox"/>	HORN ANTENNA	3115	ETS	114105	2021.11.11 (RRA)	2 year
<input checked="" type="checkbox"/>	TEST PROGRAM	e3 20181212a (V9)	AUDIX	-	-	-

Harmonic Current Emission / Voltage Fluctuations and Flicker

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
<input checked="" type="checkbox"/>	Precision Power Analyzer	PPA5511	Newtons4th Ltd	162-04957	2021.09.07	1 year
<input checked="" type="checkbox"/>	Reference Impedance Network	ES4152	NF Corp.	9074424	2021.09.07	1 year

Electrostatic Discharge

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
<input checked="" type="checkbox"/>	ESD Simulator	ESS-2000	NOISEKEN	8000C03241	2021.09.07	1 year
<input checked="" type="checkbox"/>	ESD GUN	TC-815R	NOISEKEN	ESS0382069	2021.09.07	1 year

RF Electromagnetic Field

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
<input checked="" type="checkbox"/>	Signal Generator	E4432B	Agilent	MY41310632	2021.03.16	1 year
<input checked="" type="checkbox"/>	Power Meter	E4419B	Agilent	GB38410133	2021.03.16	1 year
<input checked="" type="checkbox"/>	Power Sensor	E9300A	Agilent	MY41497992	2021.03.16	1 year
<input checked="" type="checkbox"/>	Power Sensor	E9300A	Agilent	MY41497618	2021.03.16	1 year
<input checked="" type="checkbox"/>	WIDE BAND HIGH POWER AMPLIFIER	ITA0300KL-500	INFINITECH	0300KL 20 09 001	-	-
<input checked="" type="checkbox"/>	RF POWER AMPLIFIER	ITA2000KL-120	INFINITECH	200KL 1507 001	-	-
<input checked="" type="checkbox"/>	RF POWER AMPLIFIER	ITA4500KL-70	INFINITECH	4500KL 1507 001	-	-
<input checked="" type="checkbox"/>	RF POWER AMPLIFIER	ITA0750KL-300	INFINITECH	0750KL 1507 001	-	-
<input checked="" type="checkbox"/>	Log.-Per.Antenna (80 MHz ~ 3 GHz)	K9128	RAPA	NONE	-	-

Electrical Fast Transients

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
<input checked="" type="checkbox"/>	Compact Generator	Compact NX	EMTEST	P1725200196	2021.09.03	1 year
<input checked="" type="checkbox"/>	AC Power Source	Variac NX	EMTEST	P1745207276	2021.09.03	1 year
<input checked="" type="checkbox"/>	Capacitive Coupling Clamp	CCI	EMTEST	P1744207071	2021.09.03	1 year

Surges

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
<input checked="" type="checkbox"/>	Compact Generator	Compact NX	EMTEST	P1725200196	2021.09.03	1 year
<input checked="" type="checkbox"/>	AC Power Source	Variac NX	EMTEST	P1745207276	2021.09.03	1 year
<input checked="" type="checkbox"/>	CDN	CNV 508T5	EMTEST	P1742204978	2021.09.04	1 year
<input checked="" type="checkbox"/>	CDN	CNV 508N1	EMTEST	P1742204940	2021.09.04	1 year

Conducted Disturbances, Induced by Radio-Frequency Fields

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
<input checked="" type="checkbox"/>	Signal generator	SML03	R&S	103026/0013	2021.03.16	1 year
<input checked="" type="checkbox"/>	POWER METER	NRVD	R&S	101689	2021.03.16	1 year
<input checked="" type="checkbox"/>	POWER Sensor	URV5-Z2	R&S	100755	2021.03.16	1 year
<input checked="" type="checkbox"/>	POWER Sensor	URV5-Z2	R&S	100756	2021.03.16	1 year
<input checked="" type="checkbox"/>	RF Power Amplifier	FLL75A	FRANKONIA	1033	-	-
<input checked="" type="checkbox"/>	EM INJECTION CLAMP	TSIC-23	F.C.C	529	2021.03.17	1 year
<input type="checkbox"/>	CDN (M1)	TSCDN-M1-16A	F.C.C	07004	2021.09.04	1 year
<input type="checkbox"/>	CDN (M2)	TSCDN-M2-16A	F.C.C	07008	2021.09.04	1 year
<input type="checkbox"/>	CDN (M2)	TSCDN-M2-16A	F.C.C	07009	2021.03.16	1 year
<input checked="" type="checkbox"/>	CDN (M3)	TSCDN-M3-16A	F.C.C	07016	2021.03.16	1 year
<input checked="" type="checkbox"/>	CDN (M3)	TSCDN-M3-16A	F.C.C	07017	2021.09.04	1 year

Voltage dips and Interruptions

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
<input checked="" type="checkbox"/>	Compact Generator	Compact NX	EMTEST	P1725200196	2021.09.03	1 year
<input checked="" type="checkbox"/>	AC Power Source	Variac NX	EMTEST	P1745207276	2021.09.03	1 year

Mains supply voltage variations

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
<input checked="" type="checkbox"/>	Compact Generator	Compact NX	EMTEST	P1725200196	2021.09.03	1 year
<input checked="" type="checkbox"/>	AC Power Source	Variac NX	EMTEST	P1745207276	2021.09.03	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

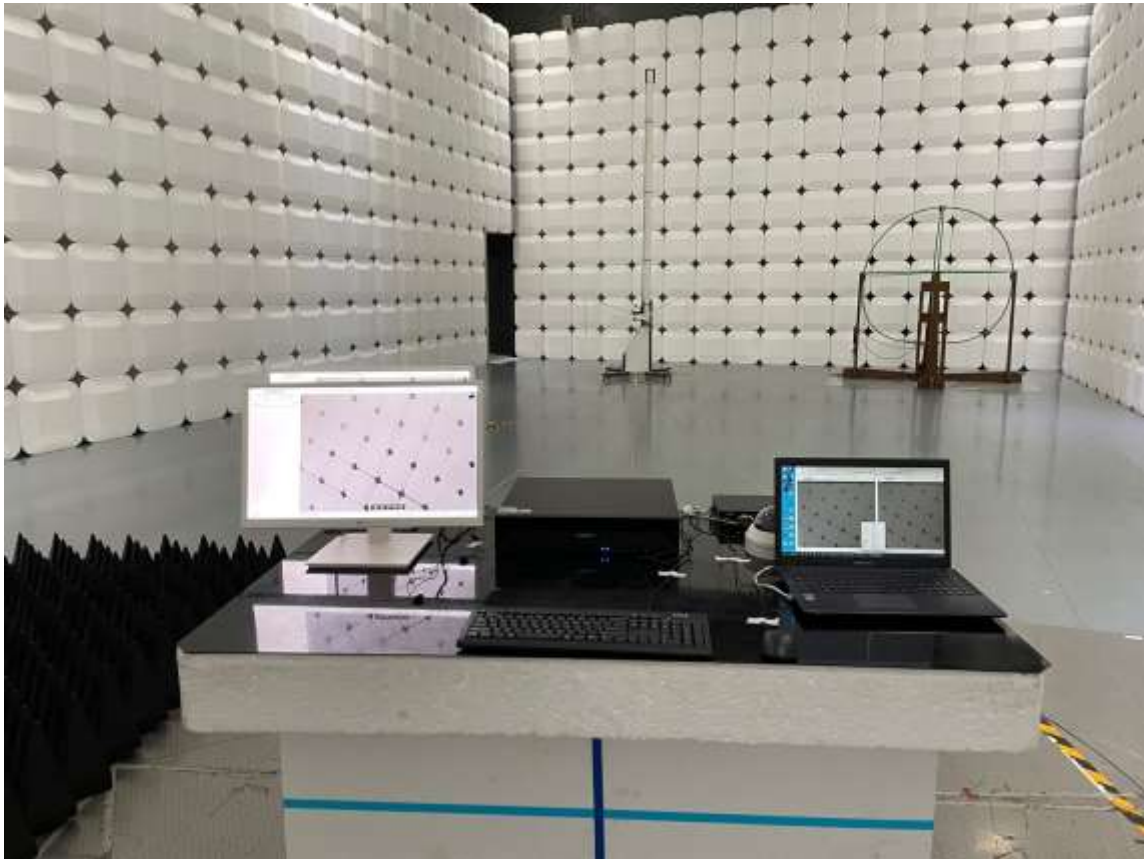
Conducted Emissions



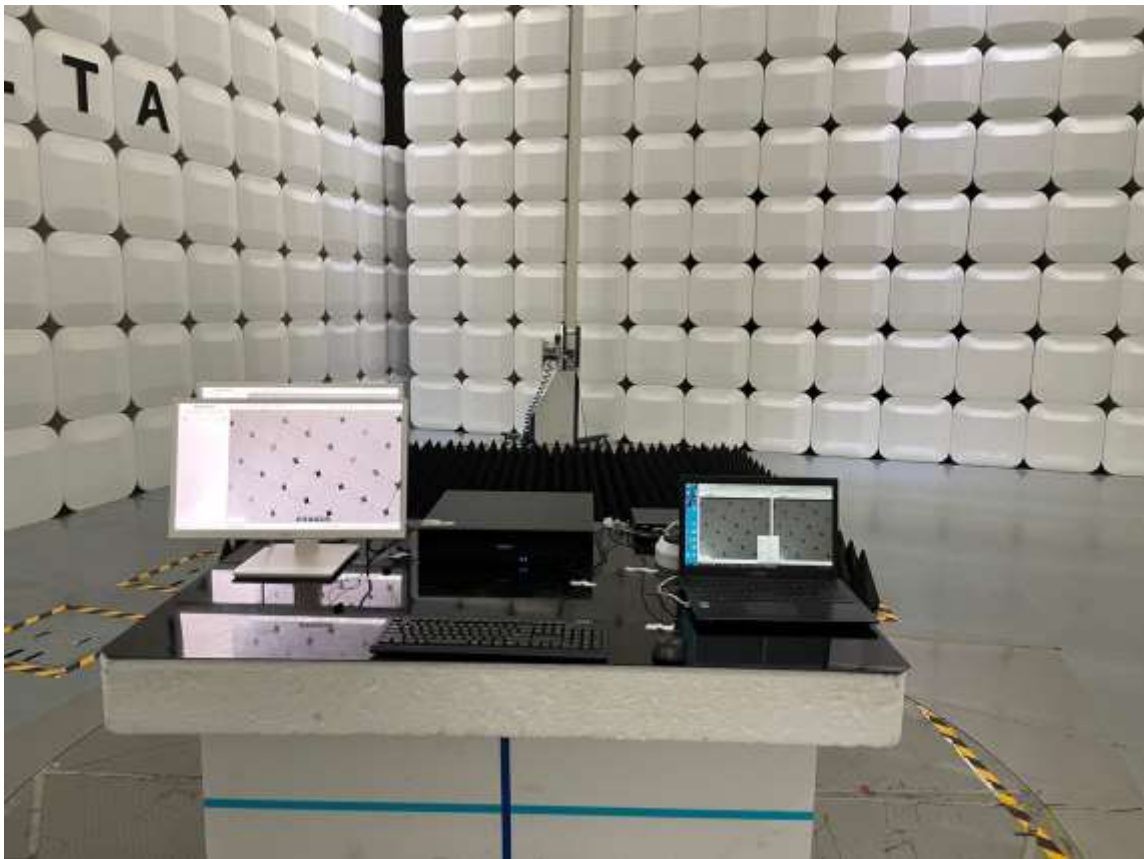
Conducted Emissions (TEL)



Radiated Emissions - Below 1 GHz



Radiated Emissions - Above 1GHz



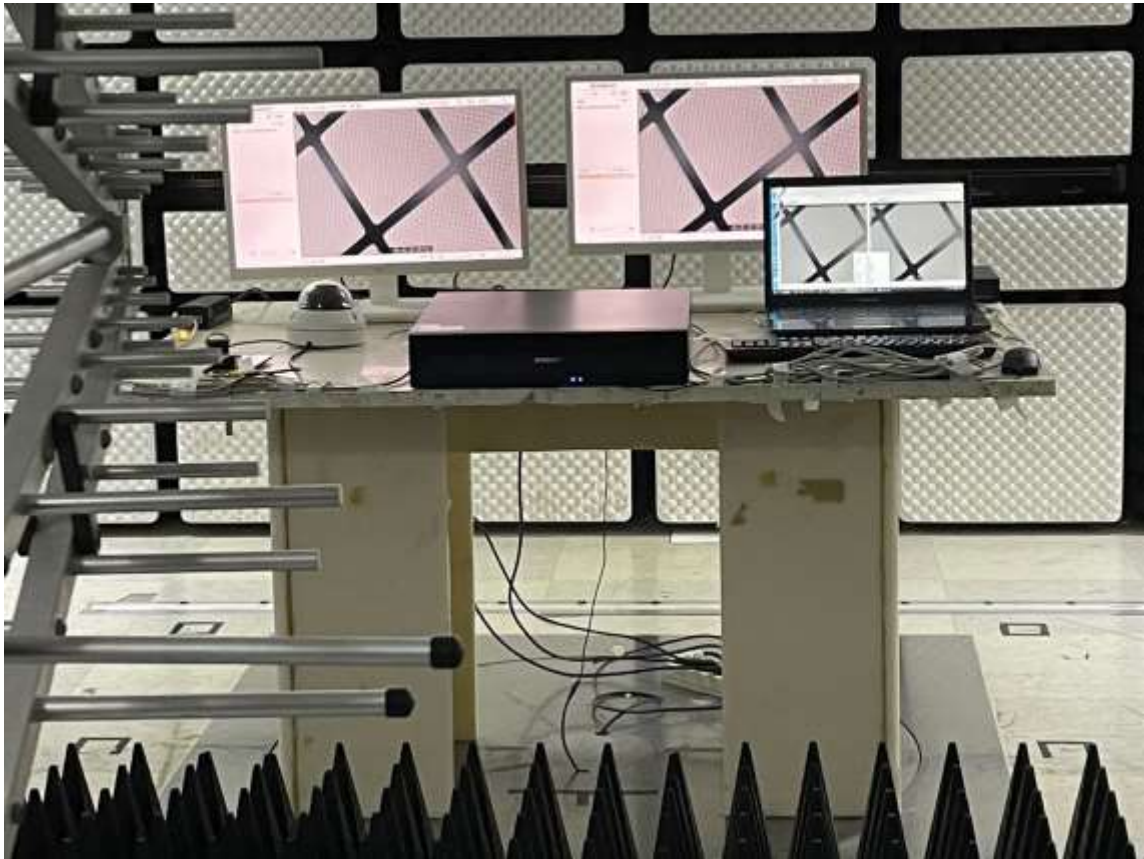
Harmonic Current Emission / Voltage Fluctuations and Flicker



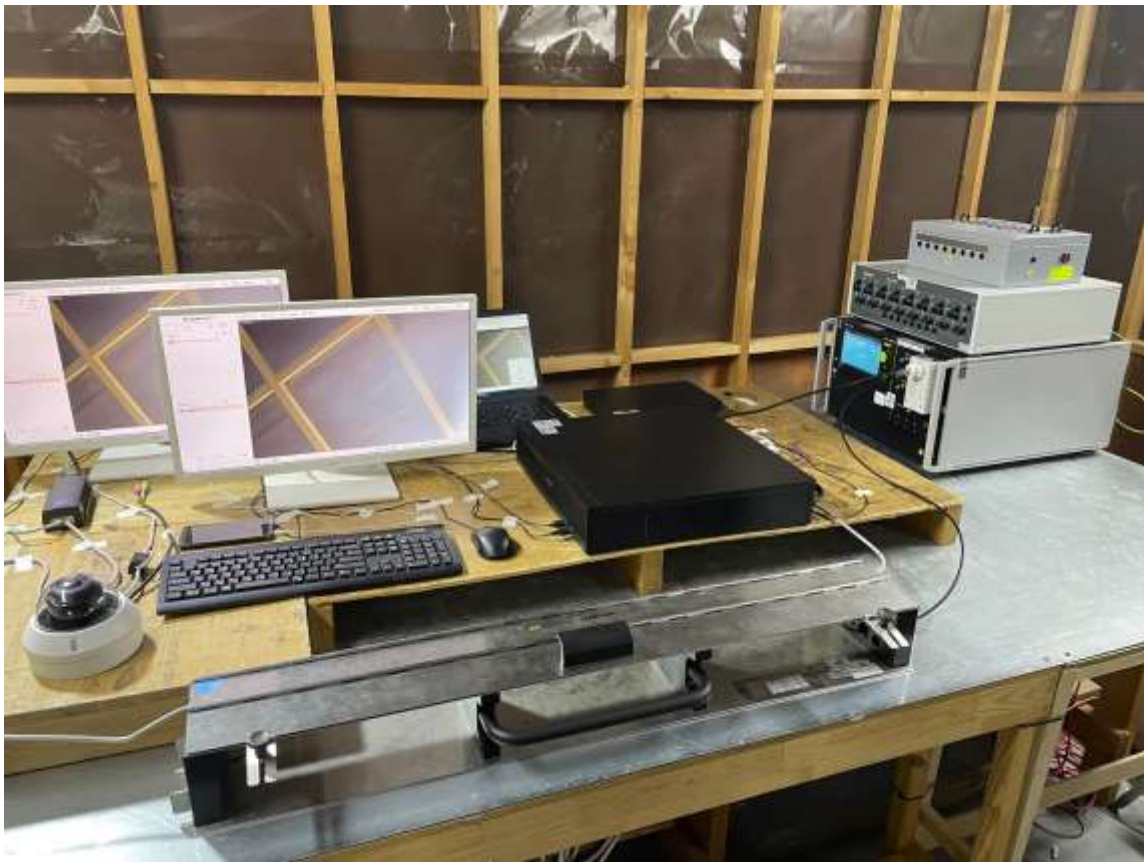
Electrostatic Discharge



RF Electromagnetic Field



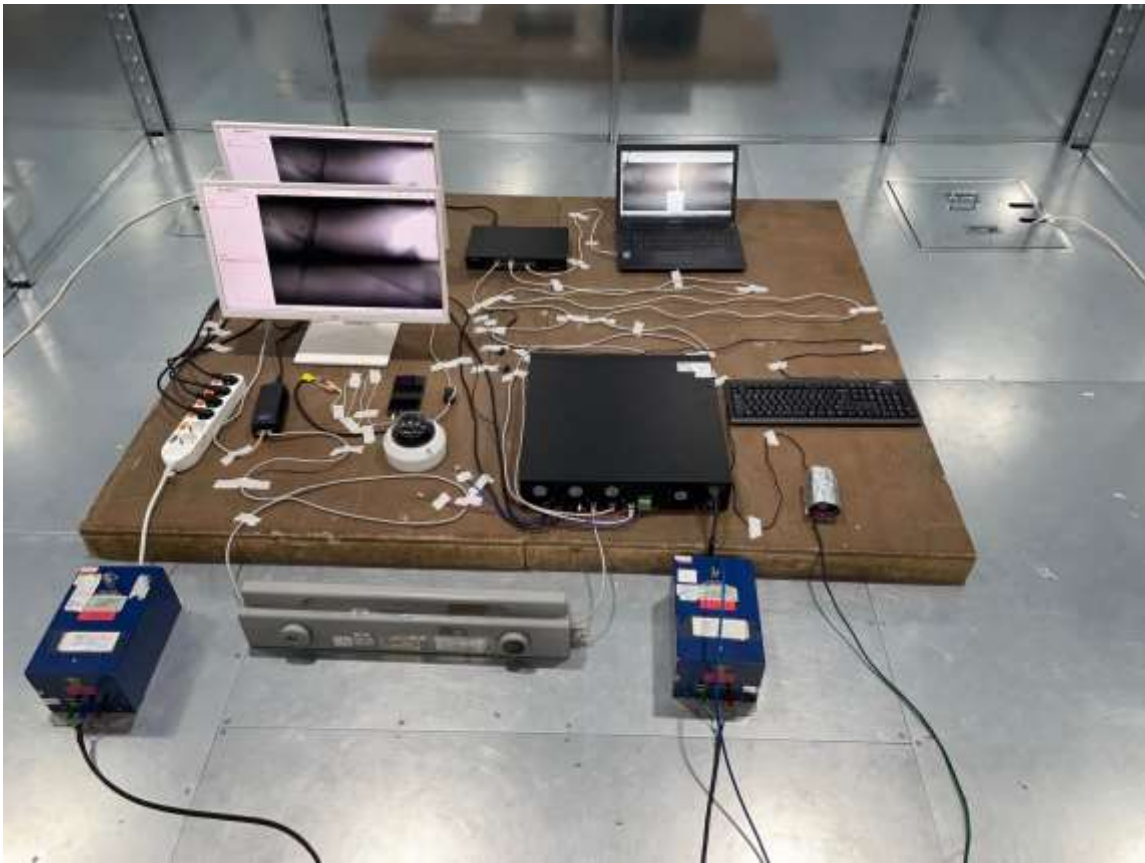
Electrical Fast Transients



Surges



Conducted Disturbances, Induced by Radio-Frequency Fields



Main supply voltage (dips, variations) short interruptions



EUT



EUT

