



4, Songju-ro 236beon-gil, Yangji-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do,
17159, Korea

Tel: +82-31-323-6008 Fax: +82-31-323-6010

<http://www.ltalab.com>

EMC TEST REPORT

Dates of Tests: October 30 – November 03, 2020

Test Report S/N: LR500122011O

Test Site : LTA Co., Ltd.

Model No.

XRN-820S

APPLICANT

Hanwha Techwin Co., Ltd.

Equipment Name : NVR
Manufacturer : HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.
Model name : XRN-820S
Test Device Serial No.: : Identification
Rule Part(s) : AS/NZS CISPR 32:2015
CISPR 32 Ed2.0

Date of issue : November 09, 2020

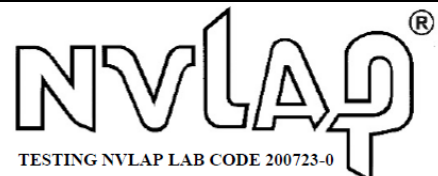
This test report is issued under the authority of:

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	09.11.2020	LR500122011O	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>
 E-mail : chahn@ltalab.com
 Telephone : +82-31-323-6008
 Facsimile : +82-31-323-6010

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the “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.
	KOREA		-	
RRA	U.S.A	KR0049	2021-04-11	RRA accredited Lab.
	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-820S
 Serial number : Identification
 Date of receipt : October 13, 2020
 EUT condition : Pre-production, not damaged
 Interface Ports : Alarm IN, Alarm OUT, Alarm Ground, AUDIO OUT, USB 2.0 #1 ~ #2, VGA,
 HDMI, POE LAN #1 ~ #8, NETWORK LAN #1 ~ #2, AC IN
 Power rating : AC 240 V, 50 Hz

2-3 Modification

-NONE

2-4 Test conditions

Temp. / Humid. / Pressure : (21 - 23) °C / (43) % R.H.
 Tested Model : XRN-820S
 Test mode : REC mode
 Test Voltage : AC 240 V, 50 Hz

2-5 List of EUT and ACCESSORY

EUT				
Equipment Name	Model Name	Serial No.	Manufacturer	Remarks
NVR	XRN-820S	N/A	HANWHA TECHWIN SECURITY VIETNAM CO.,LTD. D-TECH CO.,LTD.	-
Mouse	MOKJUO	08F03755	PRIMAX ELECTRONICS LTD	-
ACCESSORY				
Equipment Name	Model Name	Serial No.	Manufacturer	Remarks
Switch Hub	ipTIME SW1600-mini	N/A	EFM NETWORKS	-
Monitor #1	24BK550YW	902NTSU7P406	LG	-
Monitor #2	24BK550YW	902NTLE7P384	LG	-
USB Memory Stick #1	Axxen	N/A	Axxen	32 GB
USB Memory Stick #2	Axxen	N/A	Axxen	32 GB
Earphone	N/A	N/A	N/A	-
Notebook	P56	N/A	HANSUNG	-
Notebook Adapter	A10-090P3A	N/A	Chicony	-
Network Camera	QND-8021	N/A	HANWHA TECHWIN CO.,LTD	-
JIG board	N/A	N/A	N/A	-
Hard Disk	800055	WCC7KORFFL11	WESTERN DIGITAL TECHNOLOGIES, INC	-

2-6 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	1.4	NO	Plastic
	Alarm IN	JIG Board	Alarm OUT	0.4	NO	Plastic
	Alarm OUT	JIG Board	Alarm IN	0.4	NO	Plastic
	Alarm Ground	JIG Board	Alarm Ground	0.4	NO	Plastic
	AUDIO OUT	Earphone	AUX	1.2	NO	Plastic
	USB 3.0	Mouse	USB	1.2	NO	Plastic
	USB 2.0 #1	USB Memory Stick #1	-	-	-	-
	USB 2.0 #2	USB Memory Stick #2	-	-	-	-
	VGA	Monitor #1	VGA	1.5	YES	Metal
	HDMI	Monitor #2	HDMI	1.6	YES	Metal
	POE LAN #1	Network Camera	LAN	2.0	NO	Plastic
	POE LAN #2	Switch Hub(terminated)	LAN	1.0	NO	Plastic
	POE LAN #3	Switch Hub(terminated)	LAN	1.0	NO	Plastic
	POE LAN #4	Switch Hub(terminated)	LAN	1.0	NO	Plastic
	POE LAN #5	Switch Hub(terminated)	LAN	1.0	NO	Plastic
	POE LAN #6	Switch Hub(terminated)	LAN	1.0	NO	Plastic
	POE LAN #7	Switch Hub(terminated)	LAN	1.0	NO	Plastic
	POE LAN #8	Switch Hub(terminated)	LAN	1.0	NO	Plastic
	NETWORK LAN #1	Notebook	LAN	1.4	NO	Plastic
	NETWORK LAN #2	Switch Hub(terminated)	LAN	1.0	NO	Plastic
	DC OUT	Hard Disk	DC IN	0.4	NO	Plastic
	SATA	Hard Disk	SATA	0.4	NO	Plastic
Monitor#1	AC IN	AC Power Source	3 Pin AC Line	1.3	NO	Plastic
Monitor#2	AC IN	AC Power Source	3 Pin AC Line	1.4	NO	Plastic
Notebook	DC IN	Notebook Adapter	DC OUT	1.0	NO	Plastic
Notebook Adapter	AC IN	AC Power Source	3 Pin AC Line	1.2	NO	Plastic

3. Test Report

3.1 Summary of tests

Parameter	Applied Standard	Status
I. Emission		
Conducted Emissions	AS/NZS CISPR32:2015	C
Radiated Emissions	AS/NZS CISPR32:2015	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.

4. Test Items

4-1 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/Telecommunication ports.

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

Test method	: AS/NZS CISPR32:2015
Measurement Frequency range	: 150 kHz - 30 MHz
Measurement RBW	: 9 kHz
Test mode	: REC mode
Result	: Complies

Measurement Data:

- Refer to the Next page (Maximum emission configuration)

A sample calculation:

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

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)



4, Songjuro 236 Beon-gil, Yangji-myeon
Cheoin-gu, Youngin-si, Gyeonggi-do
449-822 Korea
Tel: +82-31-3236008,9
Fax: +82-31-3236010

EUT /Model No. : XRN-820S

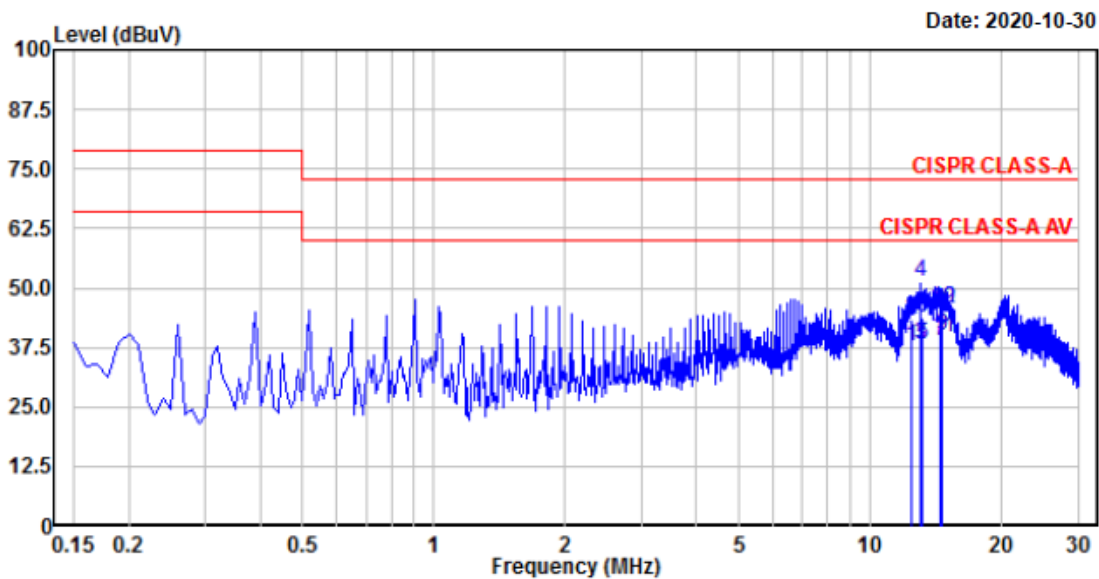
Phase : Line

Test Mode : REC mode

Test Power : 240 V / 50 Hz

Temp./ Humi. : 23 °C / 43 % 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.	12.489	23.57	17.89	19.90	43.47	37.79	73.00	60.00	29.53	22.21	Line
4.	13.065	31.56	18.09	19.92	51.48	38.01	73.00	60.00	21.52	21.99	Line
6.	13.112	24.01	18.35	19.92	43.93	38.27	73.00	60.00	29.07	21.73	Line
8.	14.485	24.99	19.02	19.95	44.94	38.97	73.00	60.00	28.06	21.03	Line
10.	14.614	25.60	19.99	19.96	45.56	39.95	73.00	60.00	27.44	20.05	Line
12.	14.655	25.58	19.78	19.96	45.54	39.74	73.00	60.00	27.46	20.26	Line

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

Conducted Emissions (NEUTRAL)



4, Songjuro 236 Beon-gil, Yangji-myeon
Cheoin-gu, Youngin-si, Gyeonggi-do
449-822 Korea
Tel:+82-31-3236008,9
Fax:+82-31-3236010

EUT /Model No. : XRN-820S

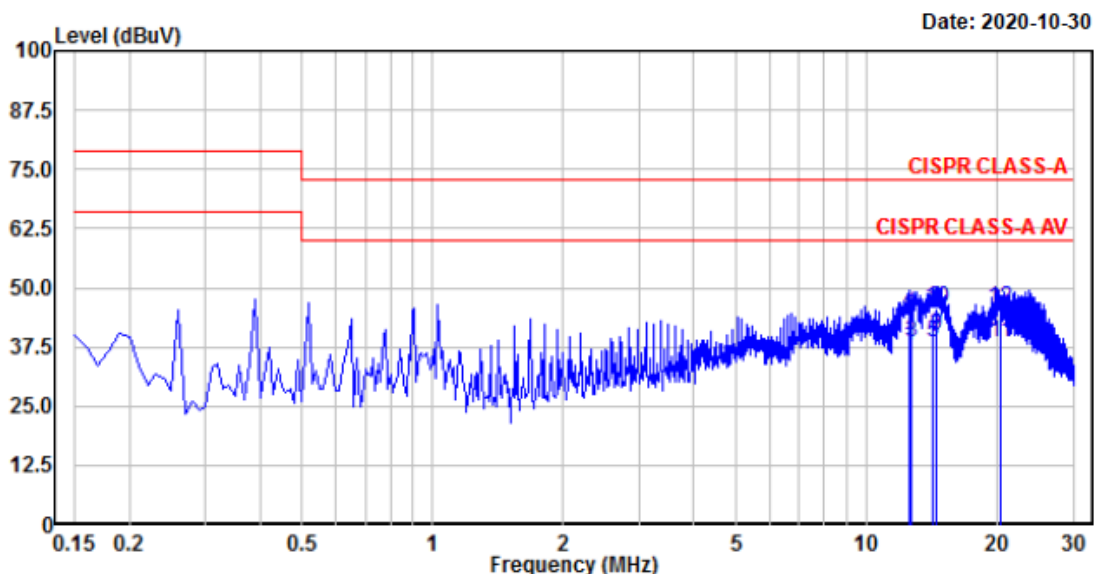
Phase : Neutral

Test Mode : REC mode

Test Power : 240 V / 50 Hz

Temp./ Humi. : 23 'C / 43 % 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.	12.529	23.81	17.88	19.92	43.73	37.80	73.00	60.00	29.27	22.20	neutral
4.	12.666	24.62	18.47	19.92	44.54	38.39	73.00	60.00	28.46	21.61	neutral
6.	14.153	24.46	18.58	19.96	44.42	38.54	73.00	60.00	28.58	21.46	neutral
8.	14.453	25.72	19.83	19.97	45.69	39.80	73.00	60.00	27.31	20.20	neutral
10.	14.516	25.83	19.87	19.97	45.80	39.84	73.00	60.00	27.20	20.16	neutral
12.	20.280	25.44	18.60	20.08	45.52	38.68	73.00	60.00	27.48	21.32	neutral

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

Conducted Emissions (TEL_10 M) / LAN #1



4, Songjuro 236 Beon-gil, Yangji-myeon
Cheoin-gu, Youngin-si, Gyeonggi-do
449-822 Korea
Tel:+82-31-3236008,9
Fax:+82-31-3236010

EUT /Model No. : XRN-820S

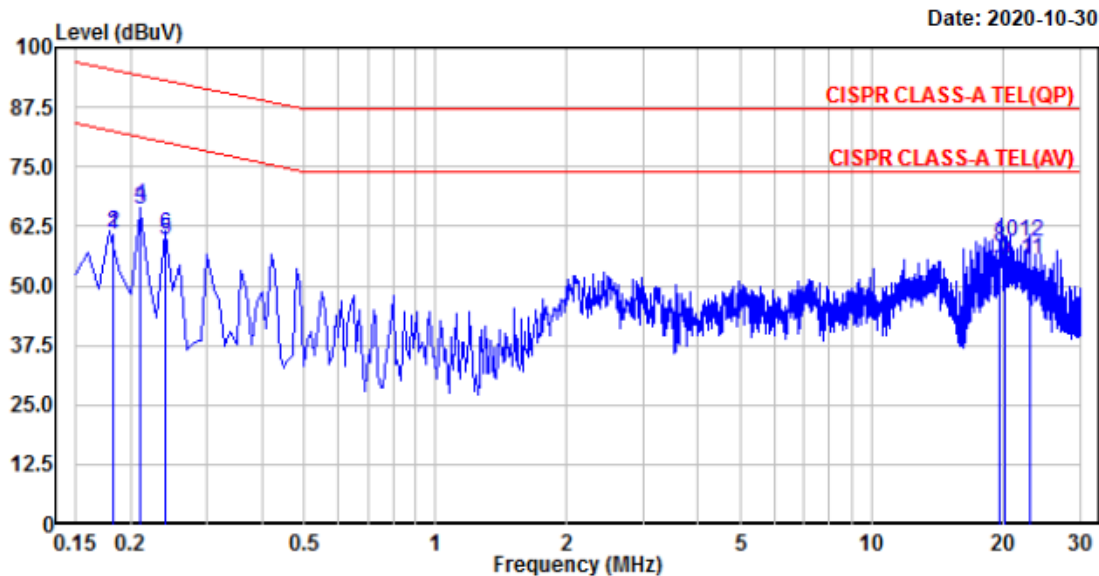
Phase : TEL_10M

Test Mode : REC mode (LAN #1)

Test Power : 240 V / 50 Hz

Temp./ Humi. : 23 'C / 43 % 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.	0.182	41.59	40.98	19.65	61.24	60.63	95.39	82.39	34.15	21.76	Line
4.	0.211	47.10	46.37	19.59	66.69	65.96	94.16	81.16	27.47	15.20	Line
6.	0.242	41.23	39.93	19.54	60.77	59.47	93.04	80.04	32.27	20.57	Line
8.	19.585	38.26	33.16	19.78	58.04	52.94	87.00	74.00	28.96	21.06	Line
10.	20.261	39.52	35.26	19.80	59.32	55.06	87.00	74.00	27.68	18.94	Line
12.	23.128	39.26	35.37	19.95	59.21	55.32	87.00	74.00	27.79	18.68	Line

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

Conducted Emissions (TEL_1000 M) / LAN #1



4, Songjuro 236 Beon-gil, Yangji-myeon
Cheoin-gu, Youngin-si, Gyeonggi-do
449-822 Korea
Tel:+82-31-3236008,9
Fax:+82-31-3236010

EUT /Model No. : XRN-820S

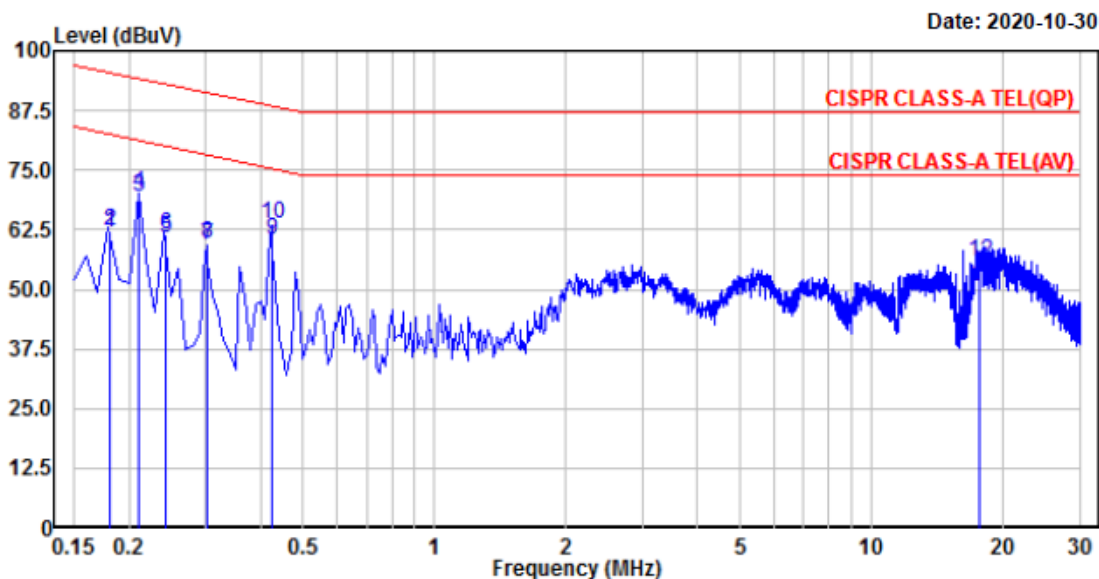
Phase : TEL_1000M

Test Mode : REC mode (LAN #1)

Test Power : 240 V / 50 Hz

Temp./ Humi. : 23 'C / 43 % 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.	0.182	42.84	42.18	19.60	62.44	61.78	95.40	82.40	32.96	20.62	Line
4.	0.211	50.75	50.03	19.53	70.28	69.56	94.16	81.16	23.88	11.60	Line
6.	0.242	42.20	41.38	19.48	61.68	60.86	93.03	80.03	31.35	19.17	Line
8.	0.303	40.05	39.98	19.42	59.47	59.40	91.16	78.16	31.69	18.76	Line
10.	0.424	44.38	41.20	19.36	63.74	60.56	88.38	75.38	24.64	14.82	Line
12.	17.695	36.17	31.06	19.55	55.72	50.61	87.00	74.00	31.28	23.39	Line

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

Conducted Emissions (TEL_10 M) / LAN #2



4, Songjuro 236 Beon-gil, Yangji-myeon
Cheoin-gu, Youngin-si, Gyeonggi-do
449-822 Korea
Tel:+82-31-3236008,9
Fax:+82-31-3236010

EUT /Model No. : XRN-820S

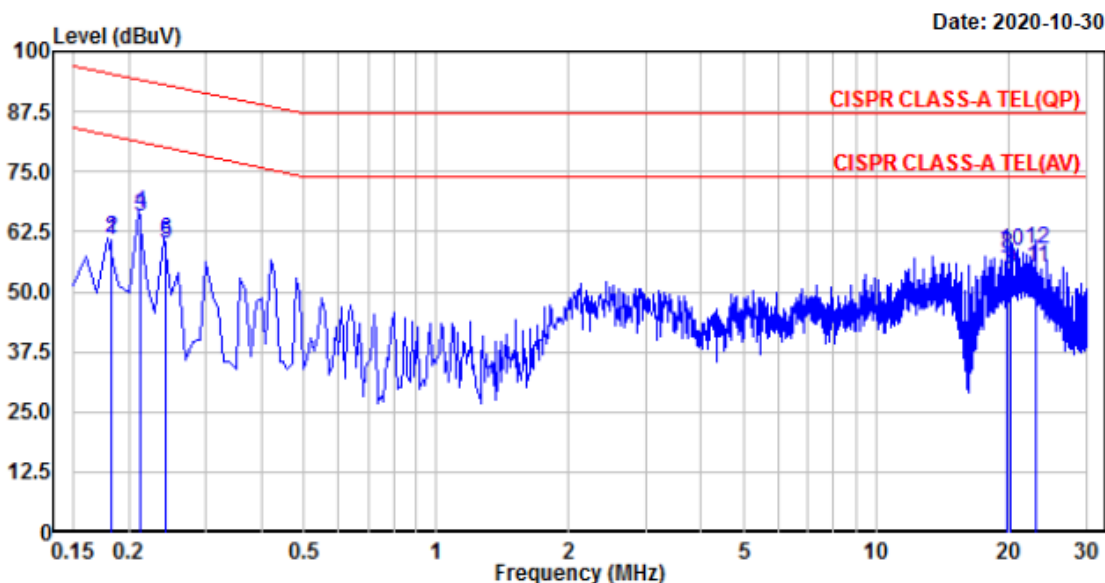
Phase : TEL_10M

Test Mode : REC mode (LAN #2)

Test Power : 240 V / 50 Hz

Temp./ Humi. : 23 'C / 43 % 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.	0.182	41.53	40.96	19.65	61.18	60.61	95.38	82.38	34.20	21.77	Line
4.	0.212	46.80	46.08	19.59	66.39	65.67	94.13	81.13	27.74	15.46	Line
6.	0.242	41.35	40.30	19.54	60.89	59.84	93.01	80.01	32.12	20.17	Line
8.	19.712	37.85	34.29	19.78	57.63	54.07	87.00	74.00	29.37	19.93	Line
10.	20.260	38.81	35.00	19.80	58.61	54.80	87.00	74.00	28.39	19.20	Line
12.	23.130	38.95	35.14	19.95	58.90	55.09	87.00	74.00	28.10	18.91	Line

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

Conducted Emissions (TEL_1000 M) / LAN #2



4, Songjuro 236 Beon-gil, Yangji-myeon
Cheoin-gu, Youngin-si, Gyeonggi-do
449-822 Korea
Tel:+82-31-3236008,9
Fax:+82-31-3236010

EUT /Model No. : XRN-820S

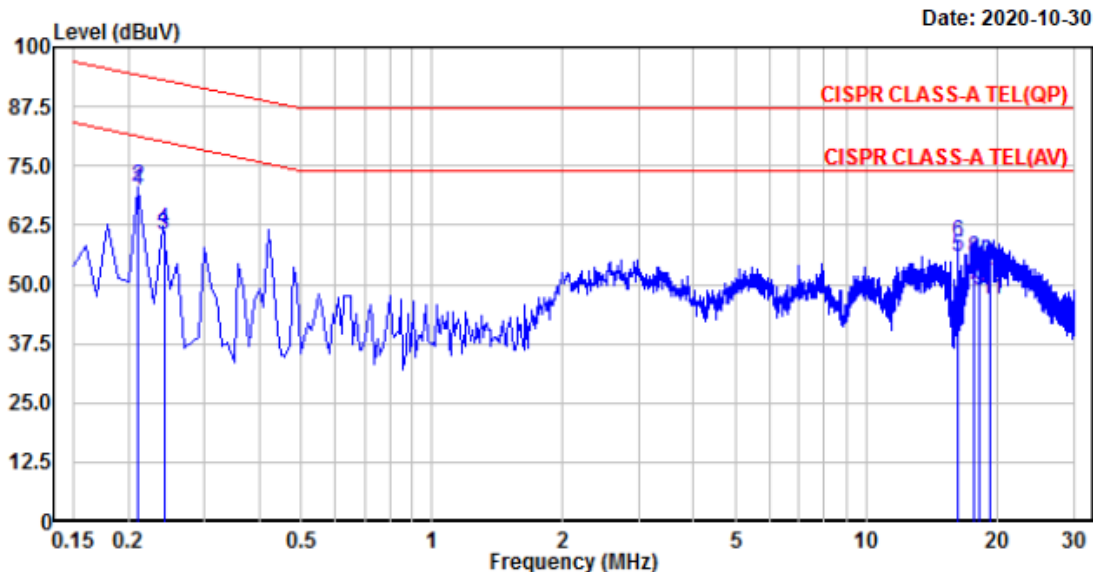
Phase : TEL_1000M

Test Mode : REC mode (LAN #2)

Test Power : 240 V / 50 Hz

Temp./ Humi. : 23 'C / 43 % 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.	0.211	51.08	50.36	19.53	70.61	69.89	94.18	81.18	23.57	11.29	Line
4.	0.242	42.14	41.07	19.48	61.62	60.55	93.04	80.04	31.42	19.49	Line
6.	16.229	39.47	36.50	19.53	59.00	56.03	87.00	74.00	28.00	17.97	Line
8.	17.694	35.73	30.36	19.55	55.28	49.91	87.00	74.00	31.72	24.09	Line
10.	18.245	35.05	29.17	19.56	54.61	48.73	87.00	74.00	32.39	25.27	Line
12.	19.310	33.31	27.09	19.59	52.90	46.68	87.00	74.00	34.10	27.32	Line

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

Conducted Emissions (TEL_10 M) / LAN #3



4, Songjuro 236 Beon-gil, Yangji-myeon
Cheoin-gu, Youngin-si, Gyeonggi-do
449-822 Korea
Tel:+82-31-3236008,9
Fax:+82-31-3236010

EUT /Model No. : XRN-820S

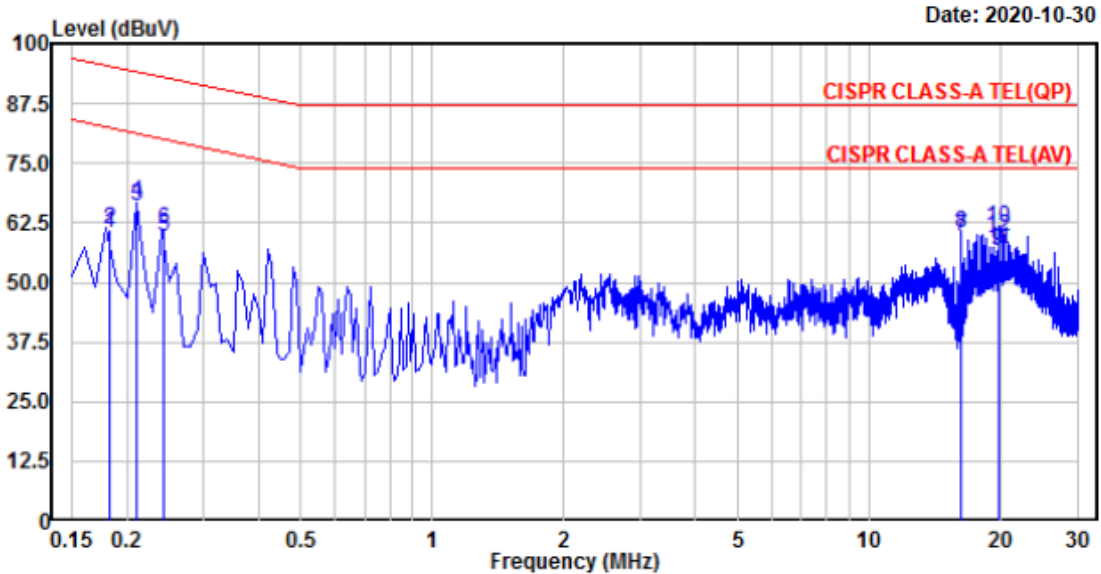
Phase : TEL_10M

Test Mode : REC mode (LAN #3)

Test Power : 240 V / 50 Hz

Temp./ Humi. : 23 'C / 43 % 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.	0.182	41.50	40.91	19.65	61.15	60.56	95.39	82.39	34.24	21.83	Line
4.	0.212	47.24	46.51	19.59	66.83	66.10	94.14	81.14	27.31	15.04	Line
6.	0.242	41.66	40.23	19.54	61.20	59.77	93.02	80.02	31.82	20.25	Line
8.	16.229	40.84	39.99	19.63	60.47	59.62	87.00	74.00	26.53	14.38	Line
10.	19.709	41.74	36.95	19.78	61.52	56.73	87.00	74.00	25.48	17.27	Line
12.	19.710	39.92	37.02	19.78	59.70	56.80	87.00	74.00	27.30	17.20	Line

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

Conducted Emissions (TEL_1000 M) / LAN #3



4, Songjuro 236 Beon-gil, Yangji-myeon
Cheoin-gu, Youngin-si, Gyeonggi-do
449-822 Korea
Tel:+82-31-3236008,9
Fax:+82-31-3236010

EUT /Model No. : XRN-820S

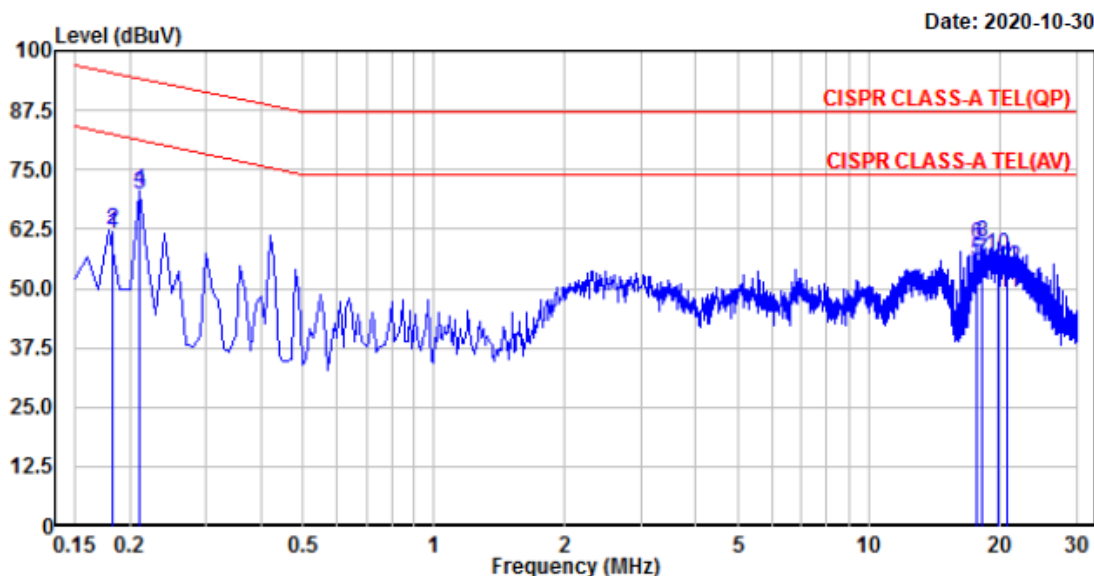
Phase : TEL_1000M

Test Mode : REC mode (LAN #3)

Test Power : 240 V / 50 Hz

Temp./ Humi. : 23 'C / 43 % 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.	0.182	42.61	42.01	19.60	62.21	61.61	95.38	82.38	33.17	20.77	Line
4.	0.212	50.95	50.24	19.53	70.48	69.77	94.14	81.14	23.66	11.37	Line
6.	17.693	39.70	36.16	19.55	59.25	55.71	87.00	74.00	27.75	18.29	Line
8.	18.243	40.25	36.19	19.56	59.81	55.75	87.00	74.00	27.19	18.25	Line
10.	19.707	37.43	32.56	19.60	57.03	52.16	87.00	74.00	29.97	21.84	Line
12.	20.805	34.88	29.52	19.62	54.50	49.14	87.00	74.00	32.50	24.86	Line

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

4-2 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	: AS/NZS CISPR32:2013
Measuring Distance	: 10 m below 1 GHz / 3 m above 1 GHz
Measurement Frequency range	: 30 MHz – 6 000 MHz
Measurement RBW	: 120 kHz @ 10 m / 1 MHz @ 3 m
Test mode	: REC mode
Result	: Complies

Measurement Data:

- Refer to the Next page (Maximum emission configuration)
- The highest internal source of an EUT is higher than 108 MHz, the measurement shall only be made up to 6 GHz.
(The highest internal source of an EUT : 1.9 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



4, Songjuro 236Beon-gil, yanggi-myeon,
Yongin-si, Gyeonggi-do, Korea
Tel : +82-31-3236008,9
Fax : +82-31-3236010
www.ltalab.com

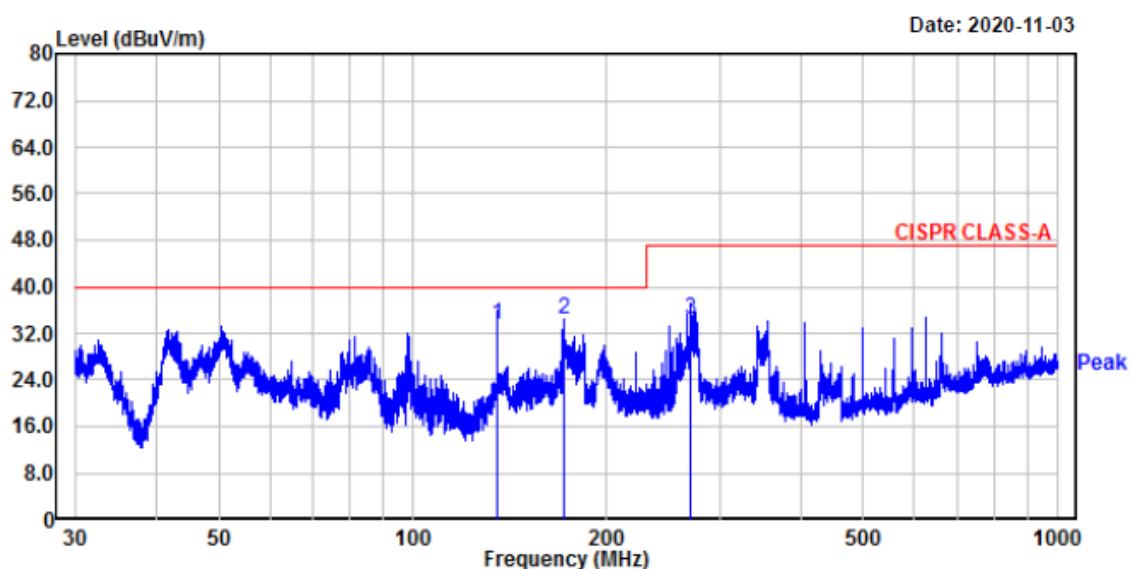
EUT/Model No.: XRN-820S

Temp/Humi: 21 'C / 43 % R.H.

Test Mode : REC mode

Tested by: CHEON S J

Power : 240 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.	135.03	46.90	-13.35	33.55	40.00	6.45	105	296	vertical
2.	171.09	47.32	-13.02	34.30	40.00	5.70	114	318	vertical
3.	270.02	46.32	-11.78	34.54	47.00	12.46	135	113	vertical

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

Radiated Emissions (Below 1 GHz) / H



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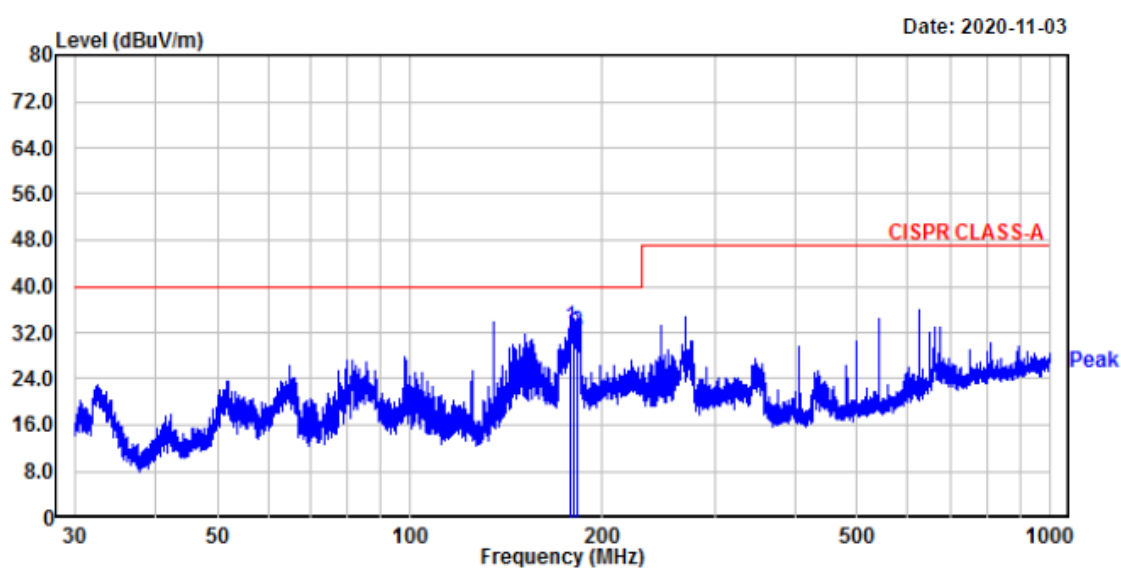
EUT/Model No.: XRN-820S

Temp/Humi: 21 'C / 43 % R.H.

Test Mode : REC mode

Tested by: CHEON S J

Power : 240 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.	178.05	46.52	-13.60	32.92	40.00	7.08	318	355	horizontal
2.	180.17	45.49	-13.75	31.74	40.00	8.26	338	345	horizontal
3.	183.20	46.03	-13.98	32.05	40.00	7.95	345	308	horizontal

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

Radiated Emissions

(Above 1 GHz) / V

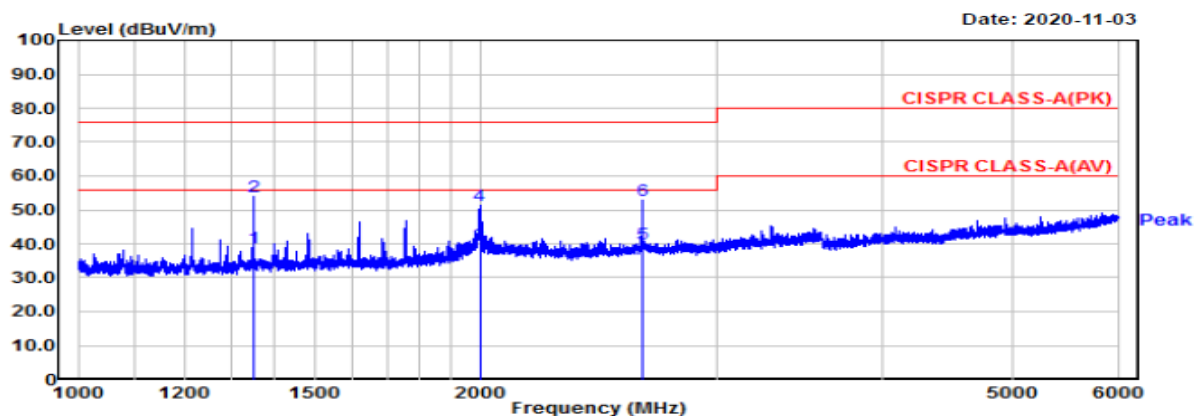
EUT/Model No.: XRN-820S

Temp/Humi: 21 °C / 43 % R.H.

Test Mode : REC mode

Tested by: CHEON S J

Power : 240 V / 50 Hz



(Above 1 GHz) / H

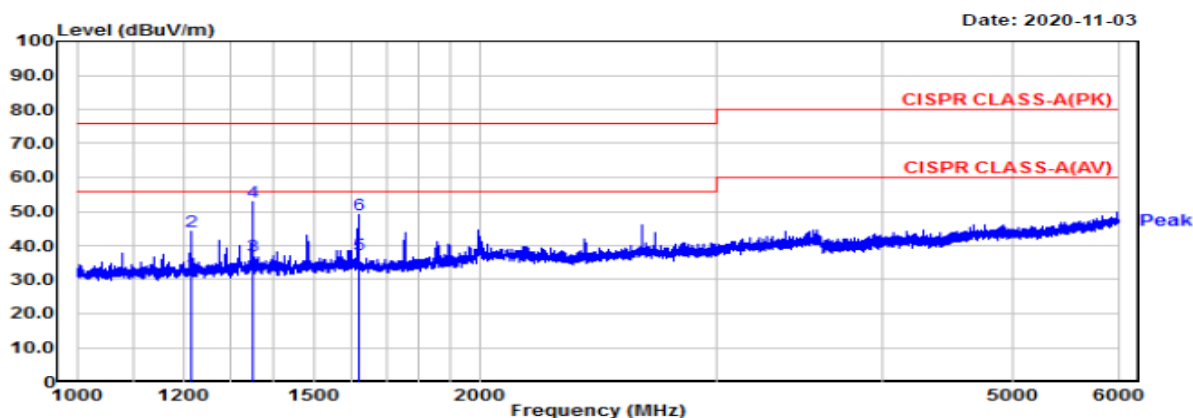
EUT/Model No.: XRN-820S

Temp/Humi: 21 °C / 43 % R.H.

Test Mode : REC mode

Tested by: CHEON S J

Power : 240 V / 50 Hz



Manufacture : HANWHA TECHWIN SECURITY VIETNAM CO.,LTD.
 D-TECH CO.,LTD.
 Model : XRN-820S
 TEST mode : REC mode

Test Date : 2020-11-03
 Temp.: 21.00 [°C]
 Humidity: 43.00 [%]
 Distance : 3.8 (m)

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
1214.86	52.36	39.85	-6.00	46.36	33.85	76.00	56.00	29.64	22.15	100	180	H
1350.02	59.75	43.75	-4.78	54.97	38.97	76.00	56.00	21.03	17.03	100	48	H
1620.01	54.52	42.85	-3.34	51.18	39.51	76.00	56.00	24.82	16.49	100	170	H
1350.02	60.61	45.61	-4.78	55.83	40.83	76.00	56.00	20.17	15.17	100	197	V
1995.16	52.63	40.95	0.66	53.29	41.61	76.00	56.00	22.71	14.39	100	332	V
2640.35	51.67	38.86	3.05	54.72	41.91	76.00	56.00	21.28	14.09	100	360	V

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 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	2021.03.16	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	-	-	-

APPENDIX B

PHOTOGRAPHS

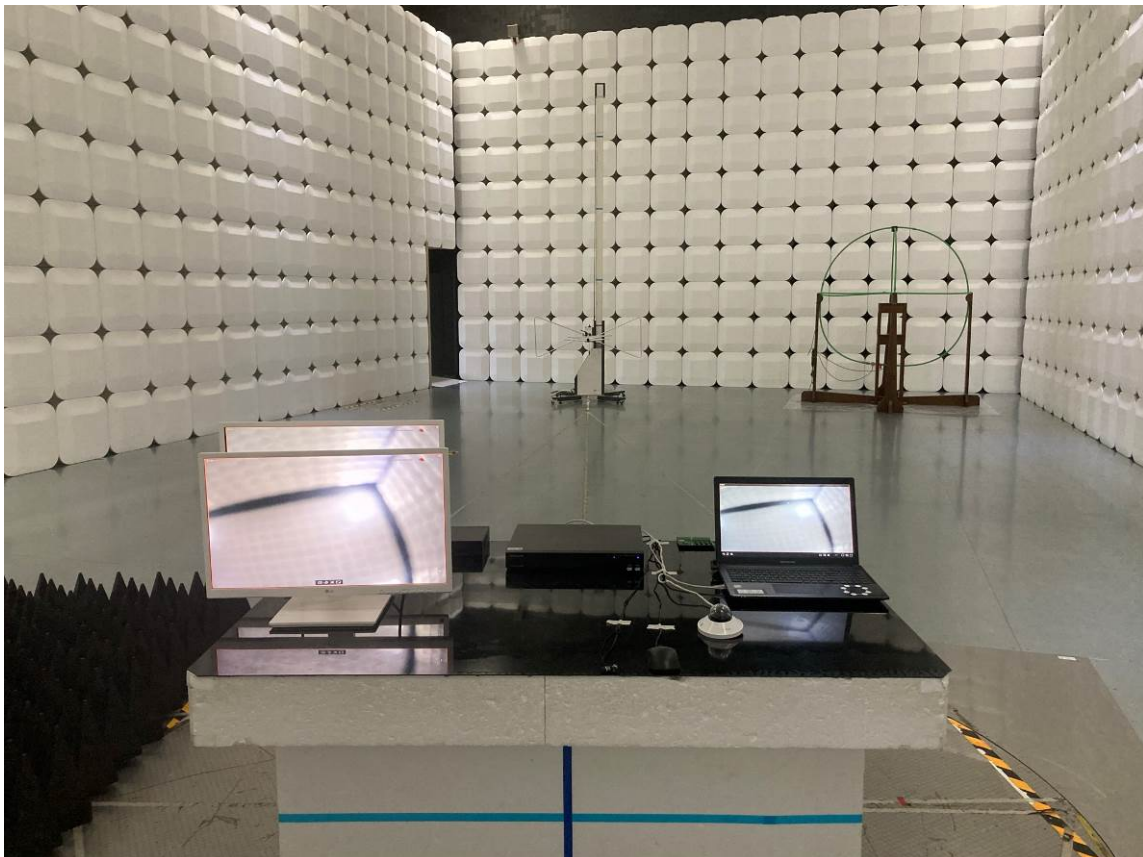
Conducted Emissions



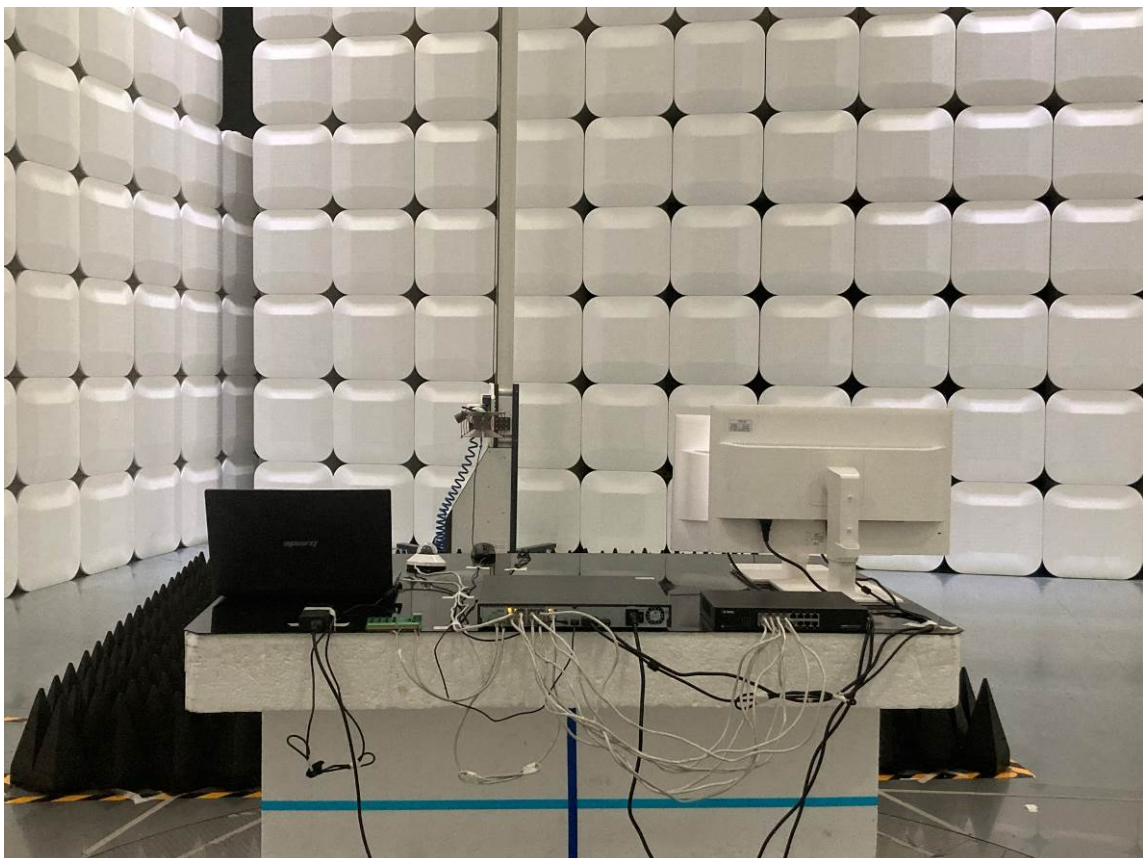
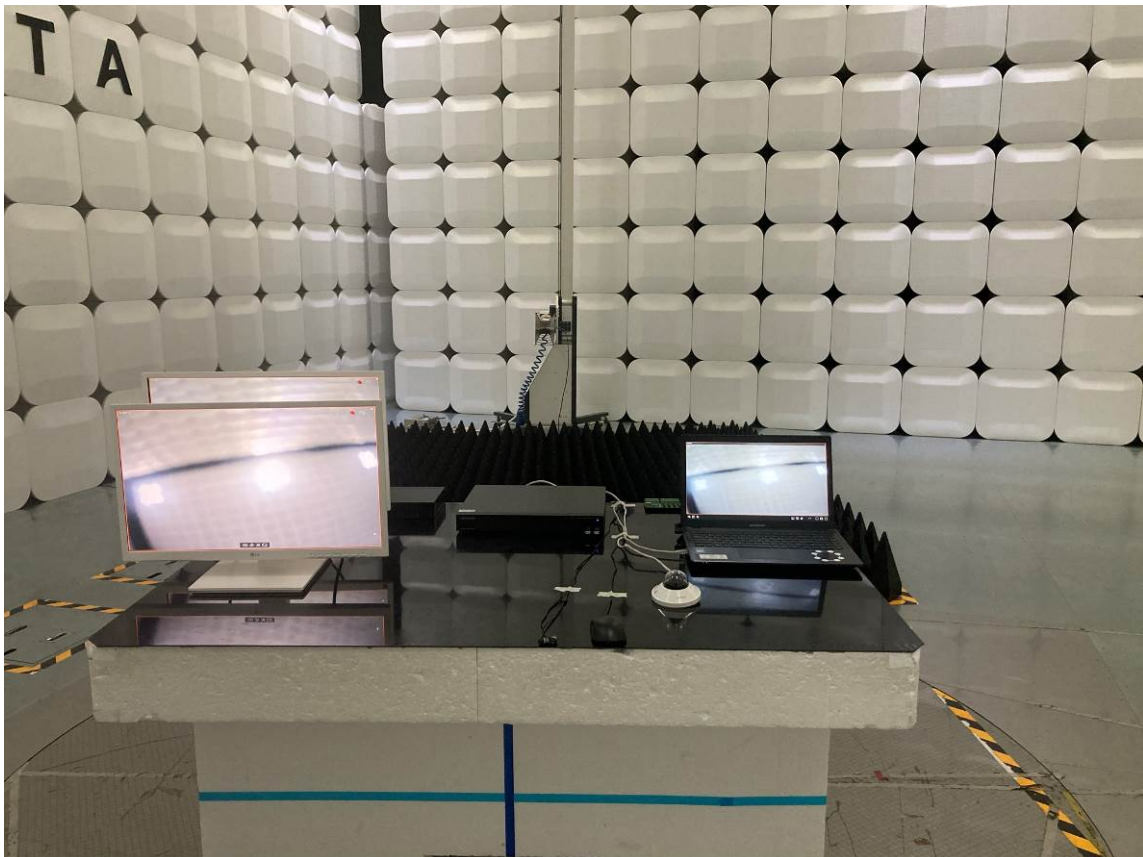
Conducted Emissions (TEL)



Radiated Emissions - Below 1 GHz



Radiated Emissions - Above 1 GHz



EUT



EUT

