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EMC TEST REPORT

Dates of Tests: May 26 - 28, 2020
Test Report S/N: LR500122006O
Test Site : LTA Co., Ltd.

Model No.

XRN-6410DB4

APPLICANT

Hanwha Techwin Co., Ltd.

Equipment Name : NVR
Manufacturer : Hanwha Techwin(Tianjin) Co., Ltd.
Model name : XRN-6410DB4
Test Device Serial No.: : Identification
Rule Part(s) : AS/NZS CISPR 32:2015
CISPR 32 Ed2.0

Date of issue : June 08, 2020

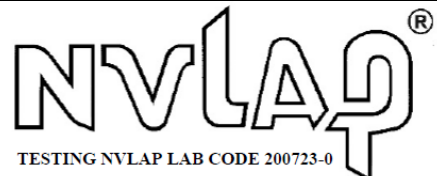
This test report is issued under the authority of:

Young Kyu Shin, Technical Manager

The test was supervised by:

Jae Hoon Kim, 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.



Revision history

Revision	Date of issue	Test report No.	Description
0	08.06.2020	LR500122006O	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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 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	2020-09-30	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(Tianjin) Co., Ltd.
 Address : No.11 Weiliu Rd, Micro-Electronic Industrial Park, TEDA, Tianjin, 300385, People's Republic of China

Factory #2

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 #3

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-6410DB4
 Serial number : Identification
 Date of receipt : May 14, 2020
 EUT condition : Pre-production, not damaged
 Interface Ports : AC IN #1 ~ #2, HDD Slot #1 ~ #4, USB Type A #1 ~ #4, Network #1 ~ #3, HDMI #1 ~ #2, AUDIO OUT, Terminal Block #1 ~ #2
 Console Port is unused port.
 Power rating : AC 240 V, 50 Hz

2-3 Modification

-NONE

2-4 Test conditions

Temp. / Humid. / Pressure : (21 - 25) °C / (36 - 46) % R.H.
 Tested Model : XRN-6410DB4
 Test mode : Operating 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-6410DB4	N/A	Hanwha Techwin(Tianjin) Co., Ltd. HANWHA TECHWIN SECURITY VIETNAM CO.,LTD. D-TECH CO.,LTD.	-
Mouse	MOKJUO	02T05870	Primax Electronics Ltd.	-
ACCESSORY				
Equipment Name	Model Name	Serial No.	Manufacturer	Remarks
NETWORK CAMERA	QNO-6032R	ZMQZ70G0GM3 0000CA	HANWHA TECHWIN CO.,LTD.	-
Notebook	1EK14PA#AB1	5CD7150WPK	HP	-
Monitor #1	24BK550Y	902NTFA7P563	LG Electronics Nanjing New Technology Co., Ltd	-
Monitor #2	24BK550Y	902NTSU7P406	LG Electronics Nanjing New Technology Co., Ltd	-
Smart Phone	SM-G610L	R59J800TCZW	SAMSUNG	-
USB Memory Stick #1	SDCZ50-008G	N/A	SANDISK	8 GB
USB Memory Stick #2	SDCZ73	N/A	SANDISK	16 GB
USB Memory Stick #3	SDCZ73	N/A	SANDISK	16 GB
Switching Hub	IPTIMEH608	N/A	EFM-Networks	-
Power Adapter	DCP015 A050600K	E239 19070513965	ZION (VIETNAM) Co., LTD	-
Speaker	N/A	N/A	N/A	-
PoE Injector	PSE305	N/A	CT Links	-
HDD #1	WDC WD40PURX-64	N/A	Western Digital	4 TB
HDD #2	WDC WD40PURX-64	N/A	Western Digital	4 TB
HDD #3	ST4000VX007- 2DT1	N/A	SEAGATE	4 TB
HDD #4	ST4000VX007- 2DT1	N/A	SEAGATE	4 TB
ALARM Test Board	N/A	N/A	N/A	-

2-6 Cable List

Cable List						
From		To		Length (m)	Shielding	
Type	I/O Port	Type	I/O Port		Cable	backshell
EUT	AC IN #1	AC Power Source	3 Pin AC Line	1.5	NO	Plastic
	AC IN #2	AC Power Source	3 Pin AC Line	1.5	NO	Plastic
	HDD Slot #1	HDD #1	-	-	-	-
	HDD Slot #2	HDD #2	-	-	-	-
	HDD Slot #3	HDD #3	-	-	-	-
	HDD Slot #4	HDD #4	-	-	-	-
	USB Type A #1	Mouse	USB	1.1	NO	Plastic
	USB Type A #2	USB Memory Stick #1	-	-	-	-
	USB Type A #3	USB Memory Stick #2	-	-	-	-
	USB Type A #4	USB Memory Stick #3	-	-	-	-
	Network #1	PoE Injector	DATA IN	10.4	NO	Plastic
	Network #2	Switching Hub	LAN #1	10.2	NO	Plastic
	Network #3	Switching Hub	LAN #2	10.2	NO	Plastic
	HDMI #1	Monitor #1	HDMI	0.9	YES	Plastic
	HDMI #2	Monitor #2	HDMI	0.8	YES	Plastic
	AUDIO OUT	Speaker	AUDIO IN	3.2	NO	Plastic
	Terminal Block #1	ALARM Test Board	ALARM IN	0.1	NO	Plastic
	Terminal Block #2	ALARM Test Board	ALARM OUT	0.1	NO	Plastic
PoE Injector	AC IN	AC Power Source	3 Pin AC Line	1.6	NO	Plastic
	DATA OUT	NETWORK CAMERA	PoE	3.2	NO	Plastic
Switching Hub	LAN #3	Notebook	LAN	1.2	NO	Plastic
	DC IN	Power Adapter	DC OUT	1.6	NO	Plastic
Power Adapter	AC IN	AC Power Source	2 Pin AC Line	-	-	Plastic
Monitor #1	AC IN	AC Power Source	3 Pin AC Line	1.2	NO	Plastic
Monitor #2	AC IN	AC Power Source	3 Pin AC Line	1.5	NO	Plastic
NETWORK CAMERA	AUDIO IN	Smart Phone	AUX	1.3	NO	Plastic
ALARM Test Board	USB Type B	Notebook	USB Type A	1.4	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	: 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 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)

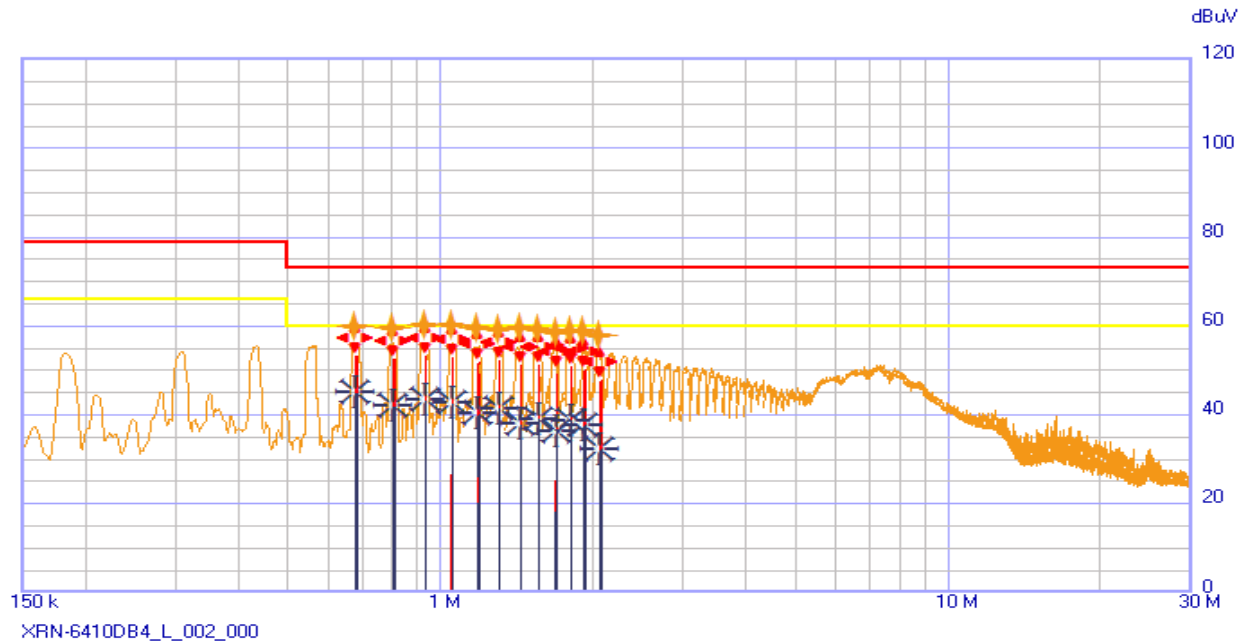
Limits of conducted common mode (asymmetric mode) disturbance at telecommunication ports in the frequency range 0.15 MHz to 30 MHz for class B equipment

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) / Operating mode (Pwr #1)



	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C CISPR A_QP CISPR A_AV	1500 ms	9 kHz	10	ON	ON	---	L1

Pulse Limiter ON
Ancillary = General

Limits:

CISPR A_QP
CISPR A_AV

Factors:

ENV216#2_191015_L
CE_CL_200109

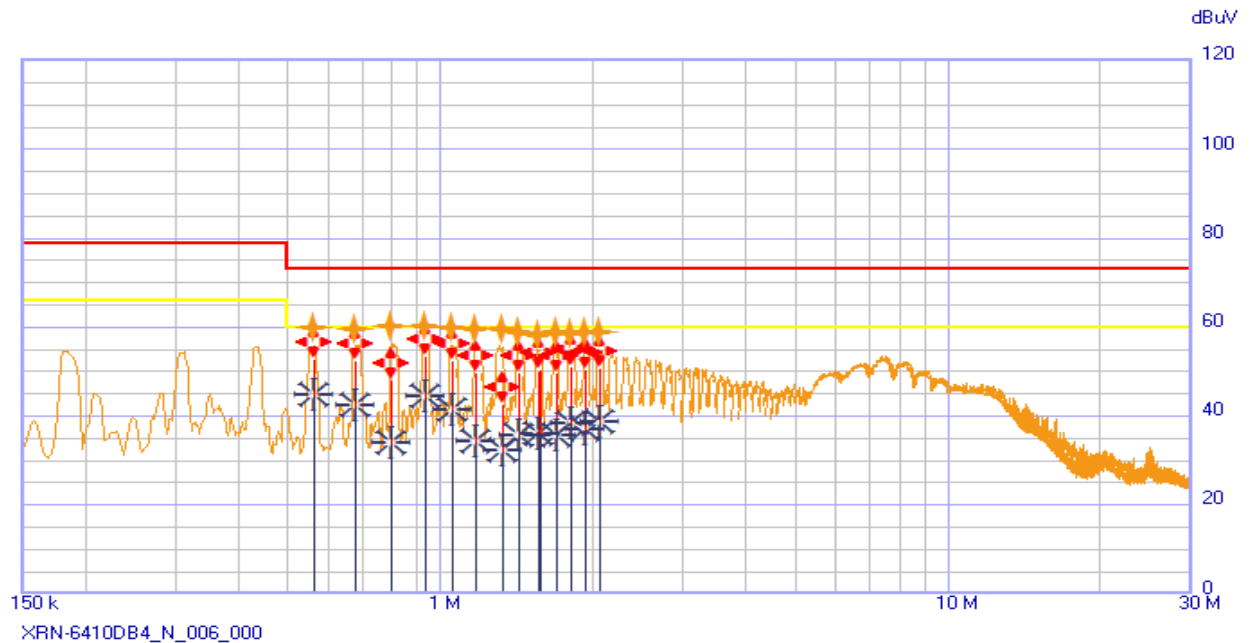
Peak
QPeak
C-Avg

EUT / Model No. : XRN-6410DB4
Test mode : Operating mode(Pwr #1)
Temp./ Humi : 24 °C / 46 %
Date : 2020-05-28

Phase : Line
Test Power : 240 V / 50 Hz
Test Engineer : KIM J H

No.	Frequency [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]
1	0.684	43.55	35.17	9.58	53.13	44.75	73.00	60.00	19.87	15.25
2	0.811	42.97	32.17	9.58	52.55	41.75	73.00	60.00	20.45	18.25
3	0.933	43.53	33.49	9.58	53.11	43.07	73.00	60.00	19.89	16.93
4	1.052	43.09	32.86	9.58	52.67	42.44	73.00	60.00	20.33	17.56
5	1.185	42.21	30.45	9.59	51.80	40.04	73.00	60.00	21.20	19.96
6	1.305	42.42	31.62	9.59	52.01	41.21	73.00	60.00	20.99	18.79
7	1.434	41.45	28.08	9.59	51.04	37.67	73.00	60.00	21.96	22.33
8	1.557	41.69	29.24	9.60	51.29	38.84	73.00	60.00	21.71	21.16
9	1.686	40.55	26.54	9.60	50.15	36.14	73.00	60.00	22.85	23.86
10	1.802	41.33	28.98	9.61	50.94	38.59	73.00	60.00	22.06	21.41
11	1.917	40.68	27.94	9.62	50.30	37.56	73.00	60.00	22.70	22.44
12	2.064	38.18	22.51	9.62	47.80	32.13	73.00	60.00	25.20	27.87

Conducted Emissions (NEUTRAL) / Operating mode (Pwr #1)



	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C CISPR A_QP CISPR A_AV	1500 ms	9 kHz	10	ON	ON	...	N

Pulse Limiter ON
Ancillary = General

Limits:
CISPR A_QP
CISPR A_AV

Factors:
ENV216#2_191015_N
CE_CL_200109

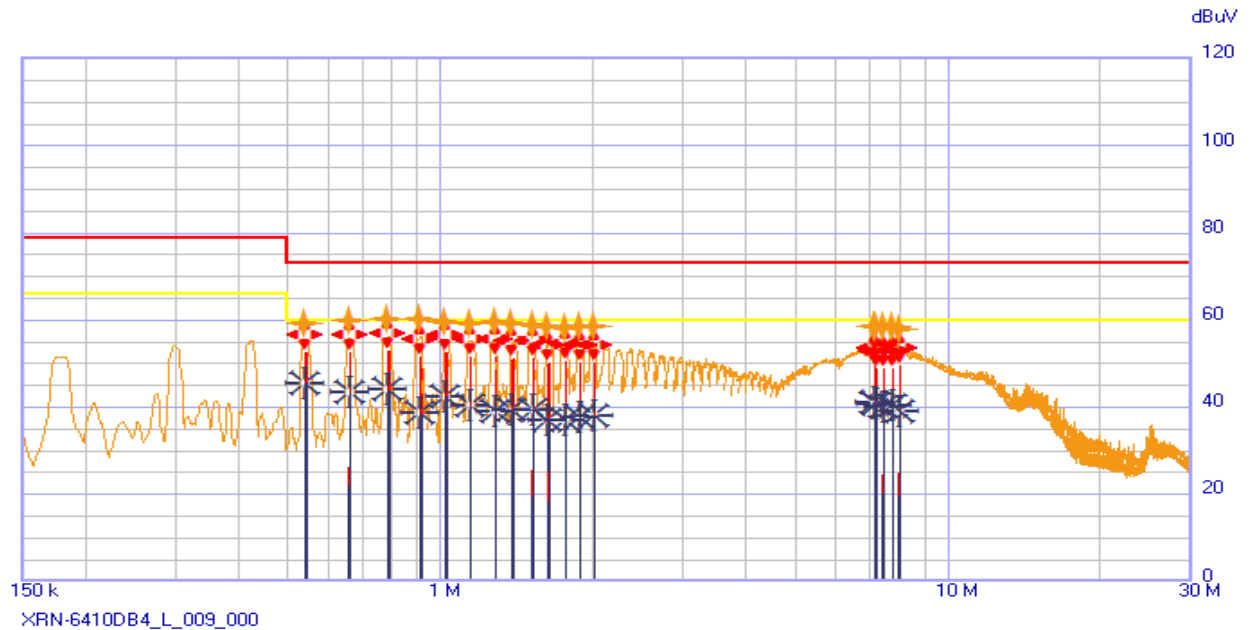
Peak ———
QPeak ———
C-Avg ———

EUT / Model No. : XRN-6410DB4
Test mode : Operating mode(Pwr #1)
Temp./ Humi : 24 °C / 46 %
Date : 2020-05-28

Phase : Neutral
Test Power : 240 V / 50 Hz
Test Engineer : KIM J H

No.	Frequency [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]
1	0.563	42.88	34.87	9.57	52.45	44.44	73.00	60.00	20.55	15.56
2	0.680	42.60	32.57	9.58	52.18	42.15	73.00	60.00	20.82	17.85
3	0.798	38.28	24.03	9.58	47.86	33.61	73.00	60.00	25.14	26.39
4	0.935	43.72	34.50	9.58	53.30	44.08	73.00	60.00	19.70	15.92
5	1.054	42.71	31.74	9.58	52.29	41.32	73.00	60.00	20.71	18.68
6	1.173	39.77	24.33	9.59	49.36	33.92	73.00	60.00	23.64	26.08
7	1.328	32.92	22.38	9.59	42.51	31.97	73.00	60.00	30.49	28.03
8	1.422	39.89	25.78	9.59	49.48	35.37	73.00	60.00	23.52	24.63
9	1.567	40.55	26.31	9.60	50.15	35.91	73.00	60.00	22.85	24.09
10	1.694	39.93	25.96	9.60	49.53	35.56	73.00	60.00	23.47	24.44
11	1.804	41.28	28.53	9.60	50.88	38.13	73.00	60.00	22.12	21.87
12	1.925	40.48	27.17	9.61	50.09	36.78	73.00	60.00	22.91	23.22
13	2.058	40.82	28.83	9.61	50.43	38.44	73.00	60.00	22.57	21.56

Conducted Emissions (LINE) / Operating mode (Pwr #2)



	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C CISPR A_QP CISPR A_AV	1500 ms	9 kHz	10	ON	ON	...	L1

Pulse Limiter ON
Ancillary = General

Limits:
CISPR A_QP
CISPR A_AV

Factors:
ENV216#2_191015_L
CE_CL_200109

Peak ———
QPeak ———
C-Avg ———

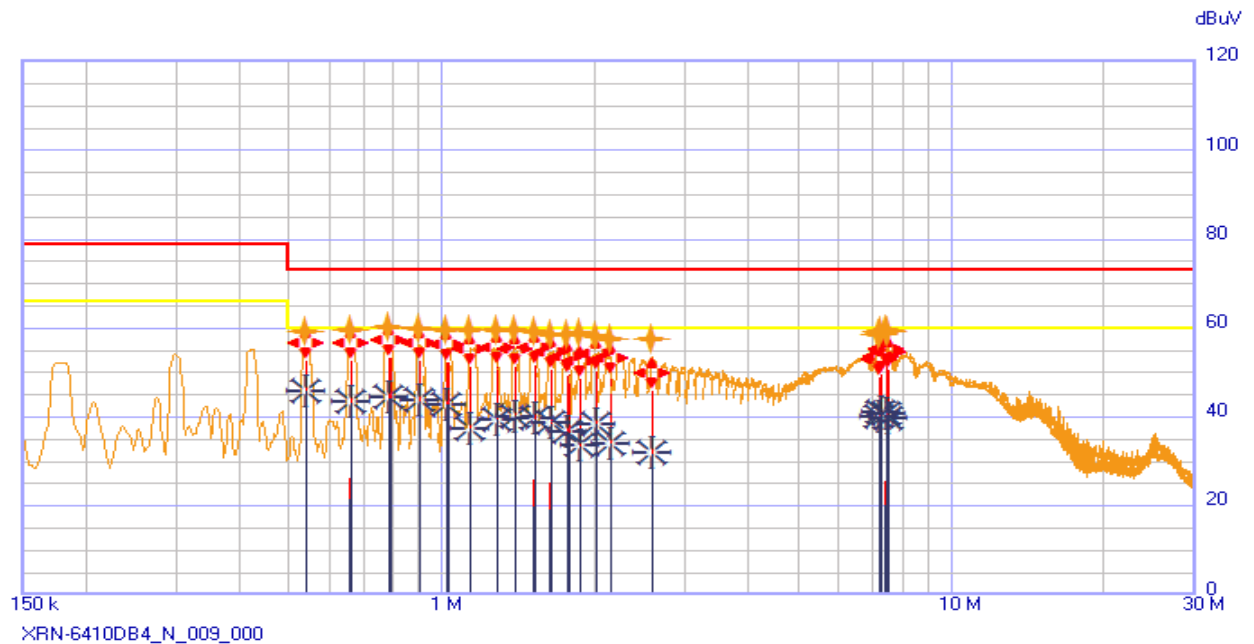
EUT / Model No. : XRN-6410DB4
Test mode : Operating mode(Pwr #2)
Temp./ Humi : 24 °C / 46 %
Date : 2020-05-28

Phase : Line
Test Power : 240 V / 50 Hz
Test Enginner : KIM J H

No.	Frequency [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]
1	0.545	43.08	35.77	9.57	52.65	45.34	73.00	60.00	20.35	14.66
2	0.661	42.85	33.76	9.58	52.43	43.34	73.00	60.00	20.57	16.66
3	0.788	43.34	34.26	9.58	52.92	43.84	73.00	60.00	20.08	16.16
4	0.915	42.03	28.76	9.58	51.61	38.34	73.00	60.00	21.39	21.66
5	1.027	42.79	32.76	9.58	52.37	42.34	73.00	60.00	20.63	17.66
6	1.144	42.04	30.54	9.58	51.62	40.12	73.00	60.00	21.38	19.88
7	1.279	41.96	29.33	9.59	51.55	38.92	73.00	60.00	21.45	21.08
8	1.387	41.66	29.67	9.59	51.25	39.26	73.00	60.00	21.75	20.74
9	1.514	41.49	29.46	9.60	51.09	39.06	73.00	60.00	21.91	20.94
10	1.626	40.57	27.19	9.60	50.17	36.79	73.00	60.00	22.83	23.21

No.	Frequency [MHz]	RD QP [dB/ μ V]	RD AV [dB/ μ V]	C.F [dB]	Result QP [dB/ μ V]	Result AV [dB/ μ V]	Limit QP [dB/ μ V]	Limit AV [dB/ μ V]	Margin QP [dB]	Margin AV [dB]
11	1.766	40.83	27.28	9.61	50.44	36.89	73.00	60.00	22.56	23.11
12	1.878	40.59	27.95	9.62	50.21	37.57	73.00	60.00	22.79	22.43
13	2.005	40.58	28.25	9.62	50.20	37.87	73.00	60.00	22.80	22.13
14	7.156	39.61	31.19	9.71	49.32	40.90	73.00	60.00	23.68	19.10
15	7.211	39.08	30.92	9.71	48.79	40.63	73.00	60.00	24.21	19.37
16	7.426	39.05	30.18	9.71	48.76	39.89	73.00	60.00	24.24	20.11
17	7.745	38.92	30.42	9.71	48.63	40.13	73.00	60.00	24.37	19.87
18	7.974	39.72	29.07	9.71	49.43	38.78	73.00	60.00	23.57	21.22

Conducted Emissions (NEUTRAL) / Operating mode (Pwr #2)



	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C CISPR A_QP CISPR A_AV	1500 ms	9 kHz	10	ON	ON	...	N

Pulse Limiter ON
Ancillary = General

Limits:
CISPR A_QP
CISPR A_AV

Factors:
ENV216#2_191015_N
CE_CL_200109

Peak
QPeak
C-Avg

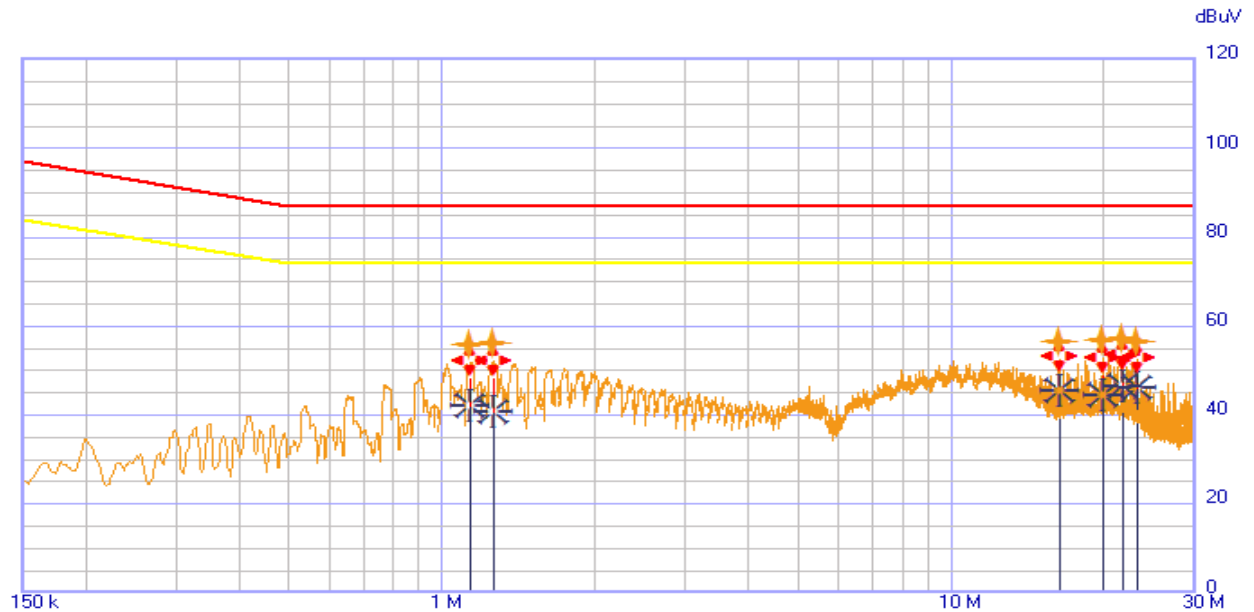
EUT / Model No. : XRN-6410DB4
Test mode : Operating mode(Pwr #2)
Temp./ Humi : 24 °C / 46 %
Date : 2020-05-28

Phase : Neutral
Test Power : 240 V / 50 Hz
Test Engineer : KIM J H

No.	Frequency [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]
1	0.543	42.93	36.03	9.56	52.49	45.59	73.00	60.00	20.51	14.41
2	0.661	42.79	33.59	9.58	52.37	43.17	73.00	60.00	20.63	16.83
3	0.788	43.47	34.50	9.58	53.05	44.08	73.00	60.00	19.95	15.92
4	0.907	42.89	33.86	9.58	52.47	43.44	73.00	60.00	20.53	16.56
5	1.027	42.63	32.97	9.58	52.21	42.55	73.00	60.00	20.79	17.45
6	1.140	41.51	27.63	9.58	51.09	37.21	73.00	60.00	21.91	22.79
7	1.279	42.05	29.73	9.59	51.64	39.32	73.00	60.00	21.36	20.68
8	1.389	41.63	30.16	9.59	51.22	39.75	73.00	60.00	21.78	20.25
9	1.516	41.74	29.88	9.60	51.34	39.48	73.00	60.00	21.66	20.52
10	1.633	40.91	28.87	9.60	50.51	38.47	73.00	60.00	22.49	21.53

No.	Frequency [MHz]	RD QP [dB/ μ V]	RD AV [dB/ μ V]	C.F [dB]	Result QP [dB/ μ V]	Result AV [dB/ μ V]	Limit QP [dB/ μ V]	Limit AV [dB/ μ V]	Margin QP [dB]	Margin AV [dB]
11	1.770	40.01	26.77	9.60	49.61	36.37	73.00	60.00	23.39	23.63
12	1.858	38.73	23.80	9.61	48.34	33.41	73.00	60.00	24.66	26.59
13	2.005	40.42	28.59	9.61	50.03	38.20	73.00	60.00	22.97	21.80
14	2.132	39.62	24.15	9.61	49.23	33.76	73.00	60.00	23.77	26.24
15	2.582	35.98	22.01	9.63	45.61	31.64	73.00	60.00	27.39	28.36
16	7.218	39.16	30.11	9.71	48.87	39.82	73.00	60.00	24.13	20.18
17	7.269	39.79	30.98	9.71	49.50	40.69	73.00	60.00	23.50	19.31
18	7.426	41.37	30.71	9.71	51.08	40.42	73.00	60.00	21.92	19.58
19	7.520	40.89	29.91	9.72	50.61	39.63	73.00	60.00	22.39	20.37

Conducted Emissions (TEL_1000 M) / LAN #1



	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C CISPR_A_TEL_1000	1500 ms	9 kHz	10	ON	ON	...	L1

Pulse Limiter ON
Ancillary = General

Limits:
CISPR_A_TEL_QP
CISPR_A_TEL_AV

Factors:
ENY81-CA6_190910
CE_CL_200709

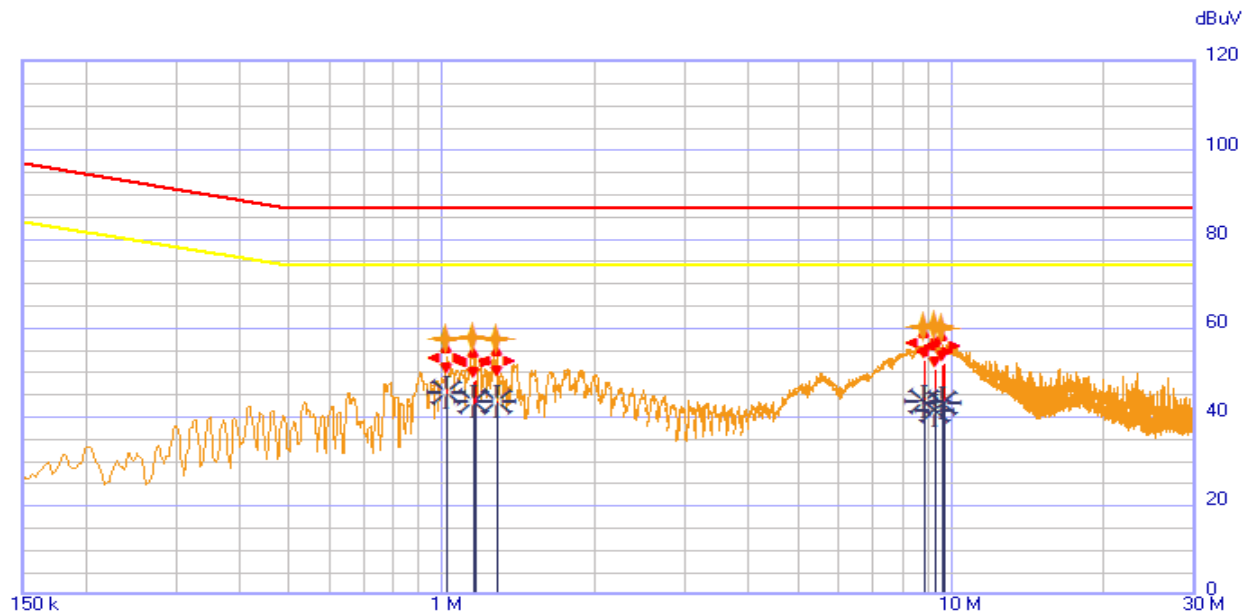
Peak
QPeak
C-Avg

EUT / Model No. : XRN-6410DB4
Test mode : Operating mode
Temp./ Humi : 25 °C / 42 %
Date : 2020-05-28

Phase : TEL_1000M (#1)
Test Power : 240 V / 50 Hz
Test Engineer : KIM J H

No.	Frequency [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]
1	1.140	38.55	32.21	9.49	48.04	41.70	87.00	74.00	38.96	32.30
2	1.256	38.46	30.87	9.48	47.94	40.35	87.00	74.00	39.06	33.65
3	16.230	39.48	35.54	9.55	49.03	45.09	87.00	74.00	37.97	28.91
4	19.710	39.14	34.69	9.59	48.73	44.28	87.00	74.00	38.27	29.72
5	21.663	40.00	36.52	9.60	49.60	46.12	87.00	74.00	37.40	27.88
6	23.128	39.15	36.12	9.63	48.78	45.75	87.00	74.00	38.22	28.25

Conducted Emissions (TEL_1000 M) / LAN #2



XRN-6410DB4_TEL_1000(#2)_002_000

	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C CISPR_A_TEL_1000	1500 ms	9 kHz	10	ON	ON	...	L1

Pulse Limiter ON
Ancillary = General

Limits:
CISPR_A_TEL_QP
CISPR_A_TEL_AV

Factors:
ENY81-CA6_190910
CE_CL_200709

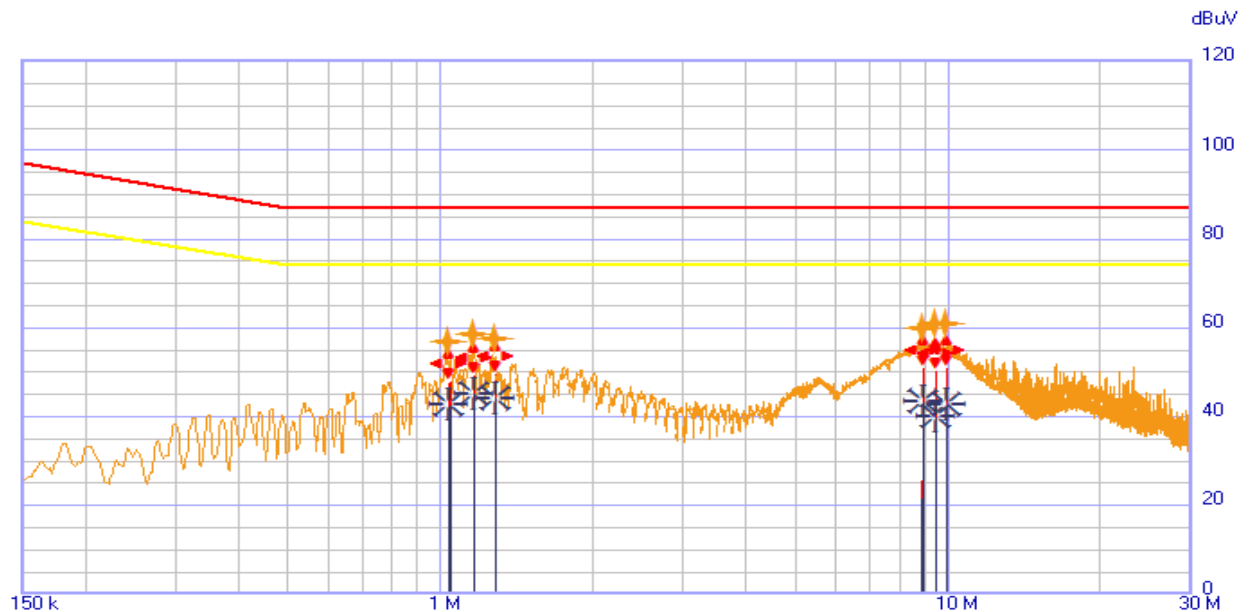
Peak
QPeak
C-Avg

EUT / Model No. : XRN-6410DB4
Test mode : Operating mode
Temp. / Humi : 25 °C / 42 %
Date : 2020-05-28

Phase : TEL_1000M (#2)
Test Power : 240 V / 50 Hz
Test Engineer : KIM J H

No.	Frequency [MHz]	RD QP [dB μ V]	RD AV [dB μ V]	C.F [dB]	Result QP [dB μ V]	Result AV [dB μ V]	Limit QP [dB μ V]	Limit AV [dB μ V]	Margin QP [dB]	Margin AV [dB]
1	1.023	39.68	35.73	9.50	49.18	45.23	87.00	74.00	37.82	28.77
2	1.160	38.62	33.68	9.48	48.10	43.16	87.00	74.00	38.90	30.84
3	1.279	39.08	33.64	9.48	48.56	43.12	87.00	74.00	38.44	30.88
4	8.835	42.94	33.81	9.47	52.41	43.28	87.00	74.00	34.59	30.72
5	9.312	41.13	31.59	9.47	50.60	41.06	87.00	74.00	36.40	32.94
6	9.631	42.27	33.41	9.48	51.75	42.89	87.00	74.00	35.25	31.11

Conducted Emissions (TEL_1000 M) / LAN #3



	Start [MHz]	Stop [MHz]	Step	Detector	Hold Time	RBW	Min Att	Pre Amp	Pre Sel	Prompt start	Ancillary
1	0.15	30	AUTO (2.045 kHz)	P Q C CISPR_A_TEL_	1500 ms	9 kHz	10	ON	ON	...	L1

Pulse Limiter ON
Ancillary = General

Limits:
CISPR_A_TEL_QP
CISPR_A_TEL_AV

Factors:
ENY81-CA6_190910
CE_CL_200T09

Peak
QPeak
C-Avg

EUT / Model No. : XRN-6410DB4
Test mode : Operating mode
Temp./Humi : 25 °C / 42 %
Date : 2020-05-28

Phase : TEL_1000M (#3)
Test Power : 240 V / 50 Hz
Test Engineer : KIM J H

No.	Frequency [MHz]	RD QP [dB μ V]	RD AV [dB μ V]	C.F [dB]	Result QP [dB μ V]	Result AV [dB μ V]	Limit QP [dB μ V]	Limit AV [dB μ V]	Margin QP [dB]	Margin AV [dB]
1	1.044	38.16	33.03	9.50	47.66	42.53	87.00	74.00	39.34	31.47
2	1.162	39.49	35.55	9.48	48.97	45.03	87.00	74.00	38.03	28.97
3	1.281	39.95	34.54	9.48	49.43	44.02	87.00	74.00	37.57	29.98
4	8.866	41.34	33.67	9.47	50.81	43.14	87.00	74.00	36.19	30.86
5	9.391	40.75	30.22	9.47	50.22	39.69	87.00	74.00	36.78	34.31
6	9.939	41.25	32.92	9.48	50.73	42.40	87.00	74.00	36.27	31.60

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	: 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 only be made up to 6 GHz.
(The highest internal source of an EUT : 3.1 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
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Fax : +82-31-3236010
www.ltalab.com

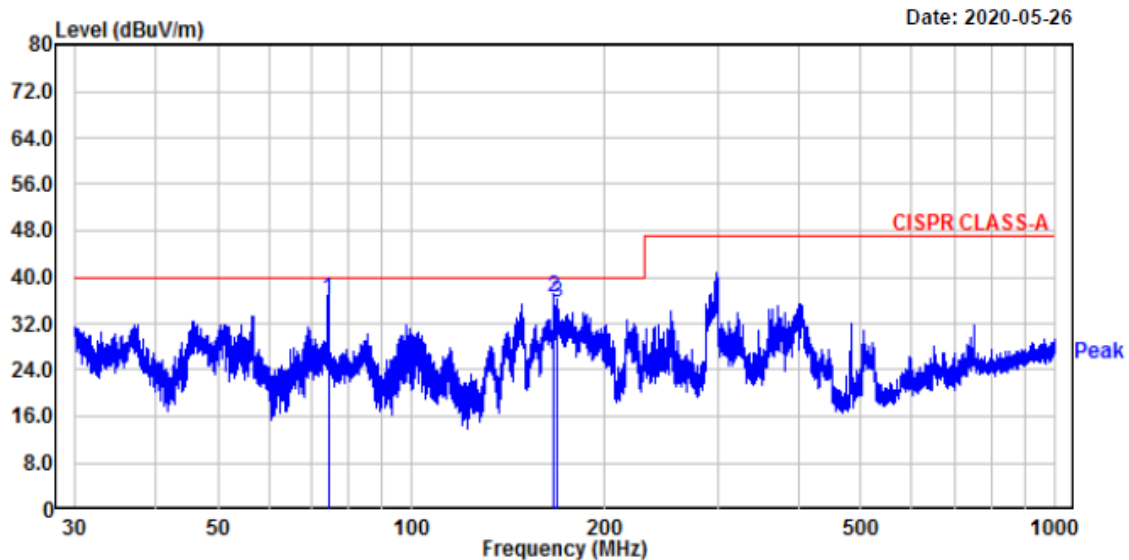
EUT/Model No.: XRN-6410DB4

Temp/Humi: 22 'C / 37 % R.H.

Test Mode : Operating mode

Tested by: KIM J H

Power : 240 V / 50 Hz



No.	Freq MHz	Reading dBuV	C.F dB	Result QP dBuV/m	Limit dBuV/m	Margin dB	Height cm	Angle deg	Polarity
1.	74.23	52.11	-15.94	36.17	40.00	3.83	105	219	vertical
2.	166.80	48.70	-12.31	36.39	40.00	3.61	107	299	vertical
3.	168.34	48.09	-12.40	35.69	40.00	4.31	108	281	vertical

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

Radiated Emissions (Below 1 GHz) / H



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www.ltalab.com

EUT/Model No.: XRN-6410DB4

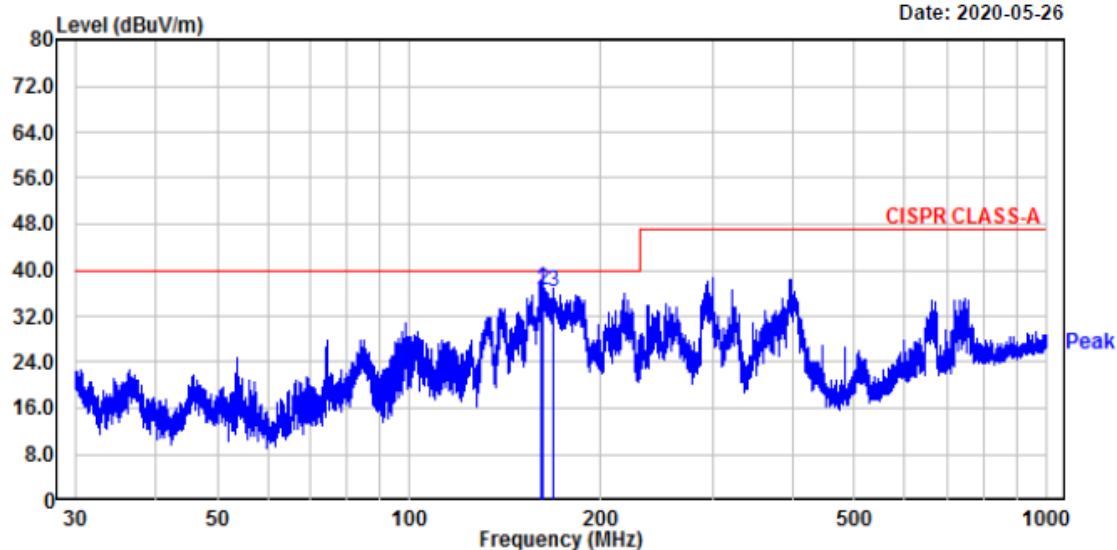
Temp/Humi: 22 'C / 37 % R.H.

Test Mode : Operating mode

Tested by: KIM J H

Power : 240 V / 50 Hz

Date: 2020-05-26



No.	Freq MHz	Reading dBμV	C.F dB	Result QP dBμV/m	Limit dBμV/m	Margin dB	Height cm	Angle deg	Polarity
1.	160.77	48.90	-12.11	36.79	40.00	3.21	391	23	horizontal
2.	162.40	48.60	-12.19	36.41	40.00	3.59	394	351	horizontal
3.	168.19	48.59	-12.40	36.19	40.00	3.81	382	13	horizontal

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

Radiated Emissions

(Above 1 GHz) / V

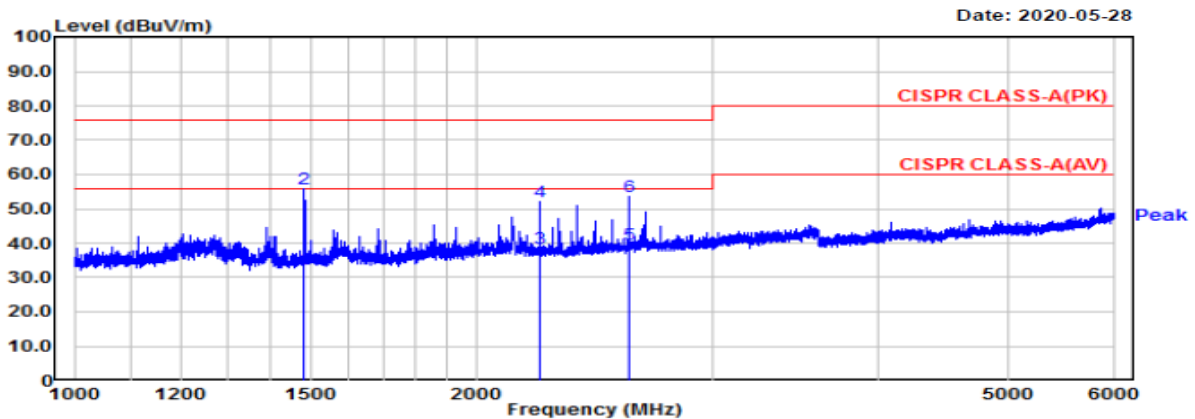
EUT/Model No.: XRN-6410DB4

Temp/Humi: 21 °C / 36 % R.H.

Test Mode : Operating mode

Tested by: KIM J H

Power : 240 V / 50 Hz



(Above 1 GHz) / H

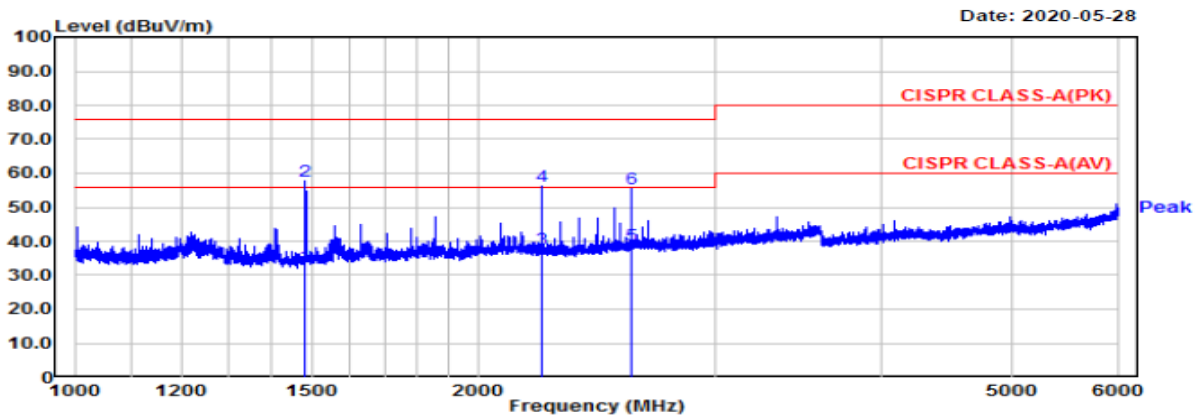
EUT/Model No.: XRN-6410DB4

Temp/Humi: 21 °C / 36 % R.H.

Test Mode : Operating mode

Tested by: KIM J H

Power : 240 V / 50 Hz



Manufacture : Hanwha Techwin(Tianjin) Co., Ltd.

Test Date

Temp.:
[°C]Humidity:
[%]Distance
(m)

Model : XRN-6410DB4

2020-05-28

21.00

36.00

3.8

TEST mode : Operating 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
1485.17	64.26	39.25	-4.45	59.81	34.80	76.00	56.00	16.19	21.20	100	260	H
2227.58	57.56	39.15	0.79	58.35	39.94	76.00	56.00	17.65	16.06	100	116	H
2599.27	54.96	38.25	2.60	57.56	40.85	76.00	56.00	18.44	15.15	100	31	H
1484.84	62.27	38.85	-4.45	57.82	34.40	76.00	56.00	18.18	21.60	100	105	V
2227.08	53.30	39.65	0.79	54.09	40.44	76.00	56.00	21.91	15.56	100	125	V
2598.69	53.10	38.95	2.59	55.69	41.54	76.00	56.00	20.31	14.46	100	275	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
☒	EMI TEST Receiver	PMM9010F	NARDA	020WW40106	2021.03.16	1 year
☒	LISN(main)	ENV216	Rohde & Schwarz	100408	2020.10.15	1 year
☒	LISN(sub)	KNW-407	Kyoritsu	8-1430-1	2020.09.06	1 year
☒	ISN	ENY81-CA6	Rohde & Schwarz	101565	2020.09.09	1 year
☒	TEST PROGRAM	PMM Emission Suite Rel. 2.33	NARDA	-	-	-

Radiated Emissions – Below 1 GHz

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	EMI TEST Receiver	ESU	Rohde & Schwarz	100092	2020.09.05	1 year
☒	Amplifier (25 dB)	8447D	HP	2944A07684	2021.03.16	1 year
☒	BILOG Antenna	VULB 9168	SCHWARZBECK	775	2021.03.26 (KOLAS)	2 year
☐	BILOG Antenna	VULB 9168	SCHWARZBECK	775	2021.11.12 (RRA)	2 year
☒	TEST PROGRAM	e3 20181212a (V9)	AUDIX	-	-	-

Radiated Emissions – Above 1 GHz

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	EMI TEST Receiver	ESU	Rohde & Schwarz	100092	2020.09.05	1 year
☒	Amplifier	8449B	HP	3008A00671	2020.09.05	1 year
☐	Amplifier	PAM-840A	COM-POWER	461314	2021.03.16	1 year
☐	HORN ANTENNA	3116B	ETS	133350	2022.05.12	2 year
☐	HORN ANTENNA	3116B	ETS	81109	2022.05.12	2 year
☒	HORN ANTENNA	3115	ETS	114105	2021.09.17 (KOLAS)	2 year
☐	HORN ANTENNA	3115	ETS	114105	2021.11.11 (RRA)	2 year
☒	TEST PROGRAM	e3 20181212a (V9)	AUDIX	-	-	-

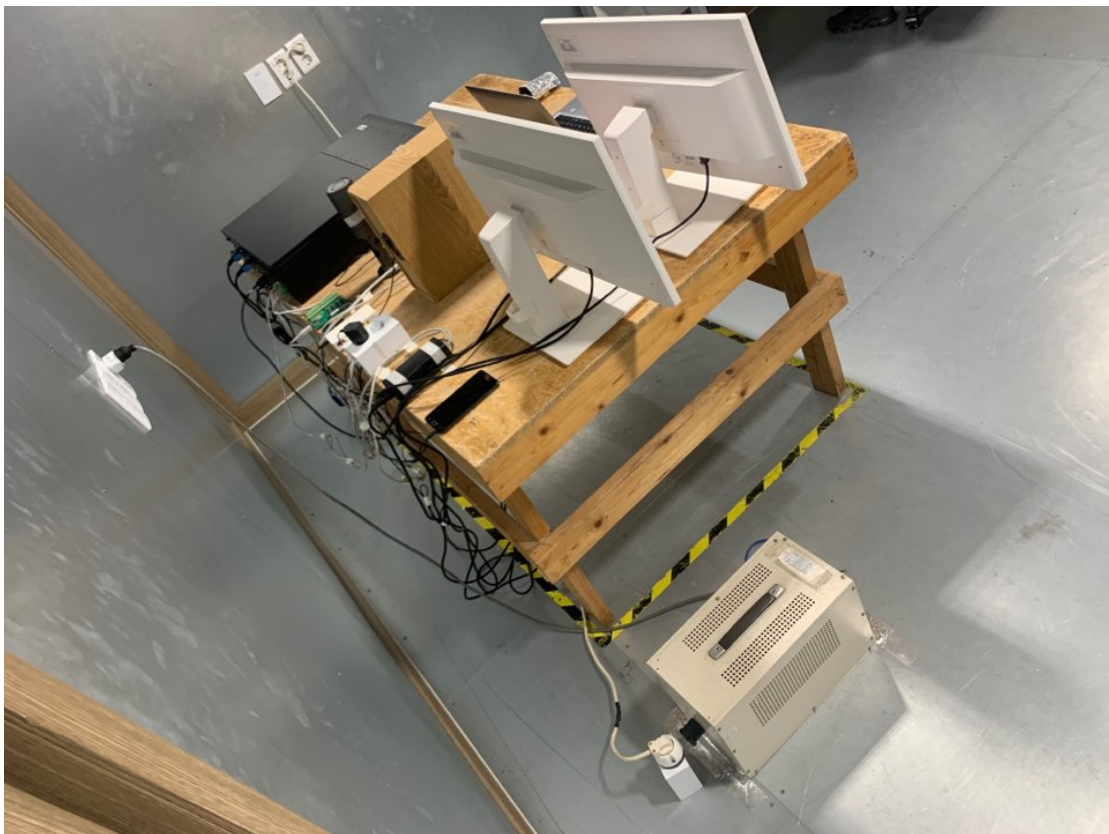
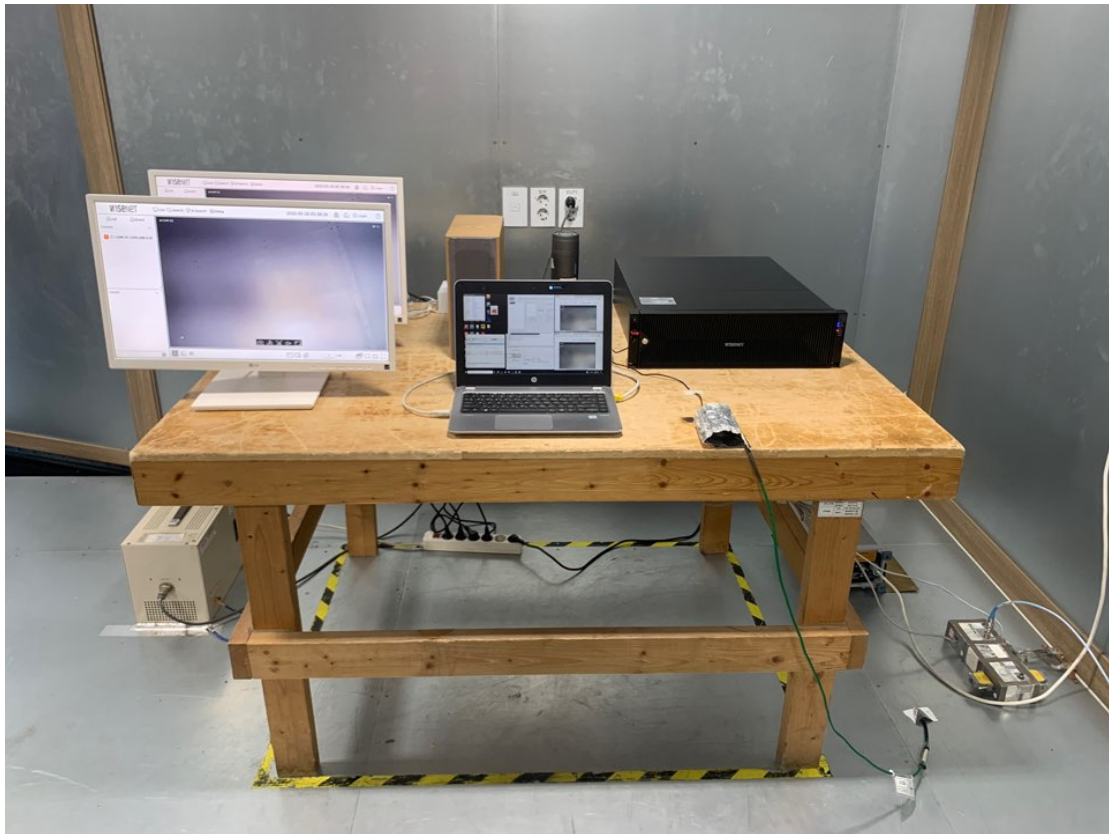
APPENDIX B

PHOTOGRAPHS

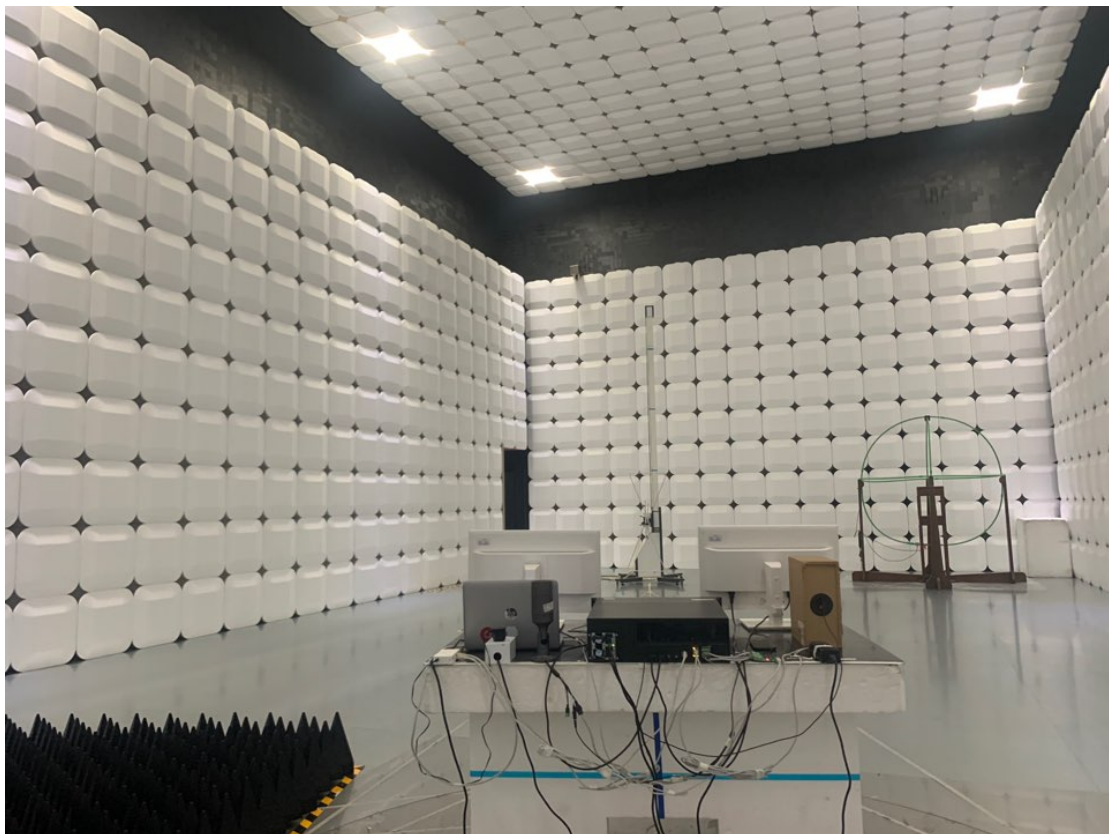
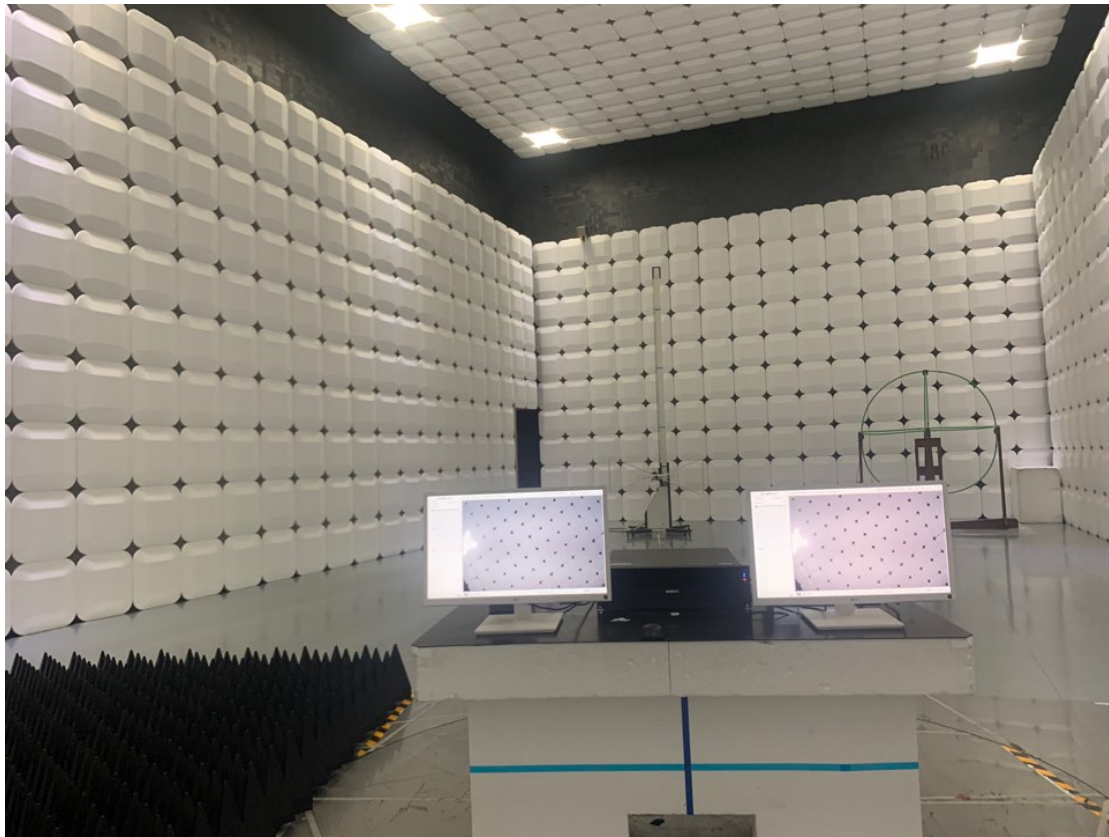
Conducted Emissions



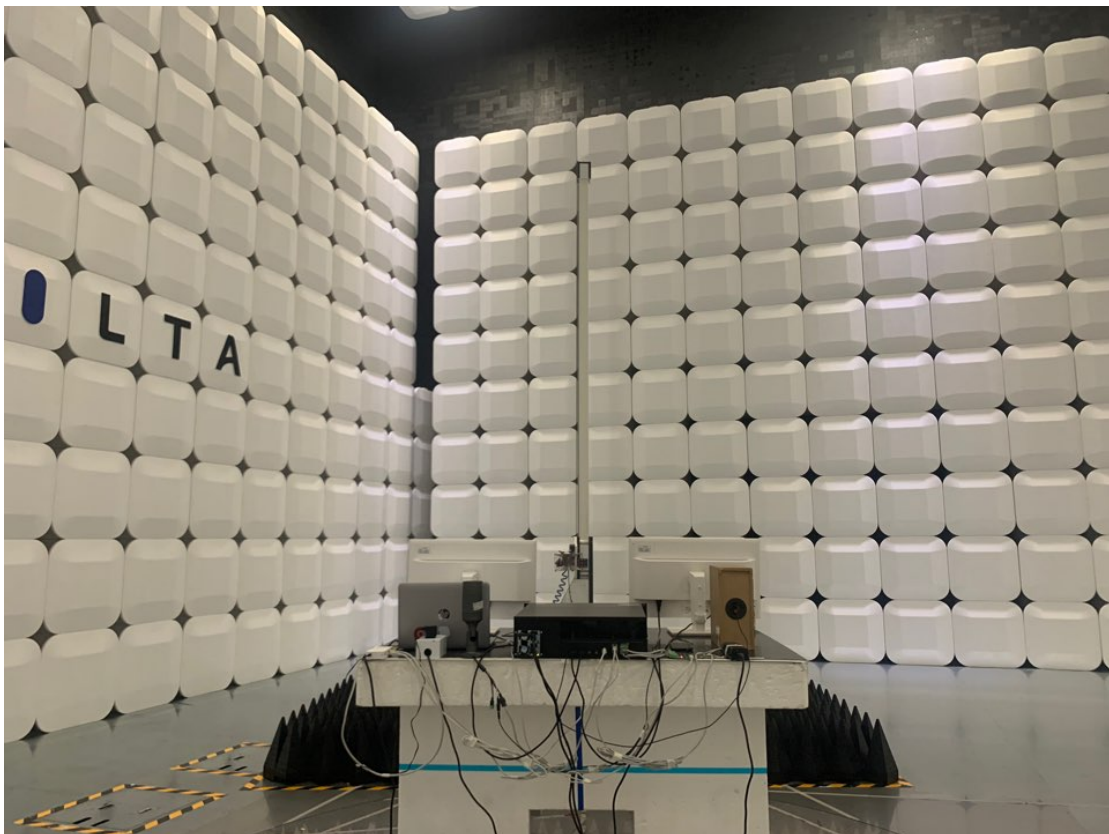
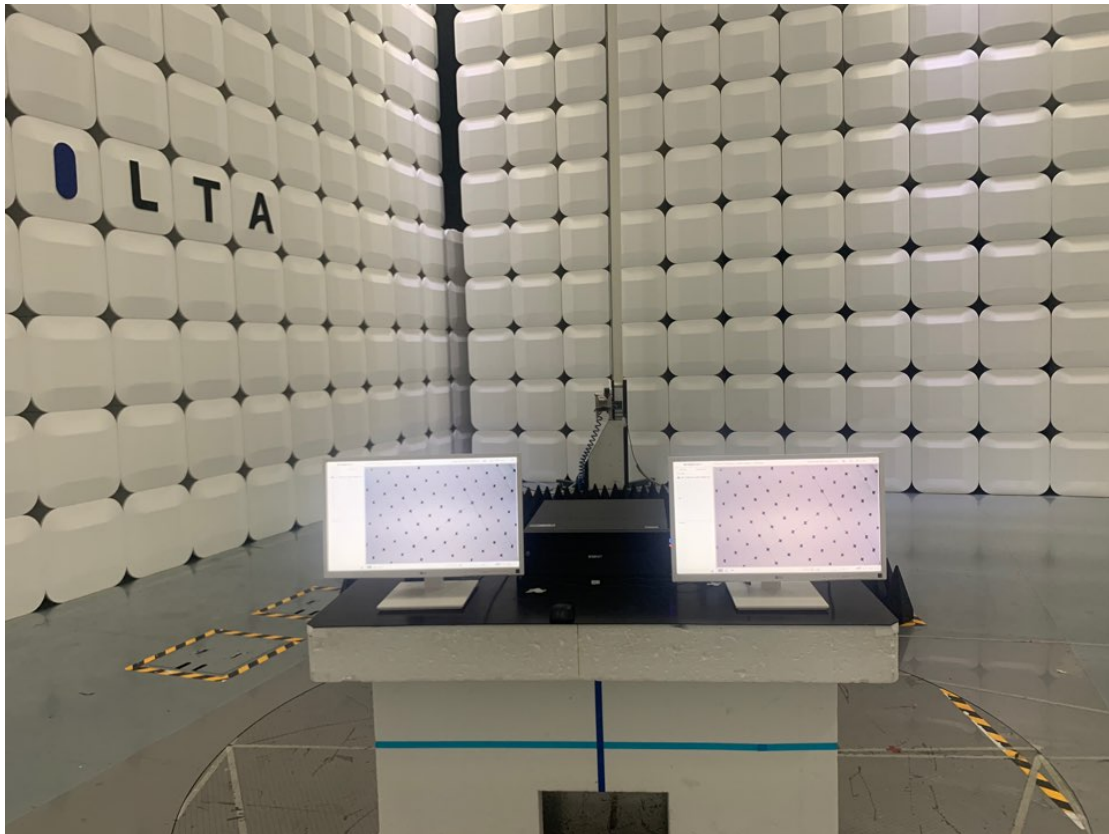
Conducted Emissions (TEL)



Radiated Emissions - Below 1 GHz



Radiated Emissions - Above 1 GHz



EUT



EUT

