

Verification

**With The 47 CFR, Part2 and Part15 Of FCC Requirement
&
ICES-003**

Hereby certifies that

Type of device: All other devices

Category: NETWORK CAMERA

Model No.: XNB-6001N

Manufactures and address

Hanwha Techwin Co., Ltd.

1204, Changwon-daero, Seongsan-gu, Chang-won-si, Gyeongsangnam-do, korea

This document is the proof that above product, system, and also relates OEM models are complying with FCC requirement. We, LTA Co., Ltd is the accredited EMC laboratory for NVLAP(US), RRA(KOREA).

We certify that the above products had performed test on our laboratory and it was confirmed to comply with FCC and IC requirement. These products might be marketed at the US accordance to DoC of FCC Rule and ICES-003 based on the standard 47CFR Part 2 and 15. The test was performed accordance to the procedures from ANSI C63.4-2014. Test data and results are issue on the EMC test report No. as follows.

Reference Endorsed Test Report No. is LR500111708R

Date: August 24, 2017



Young Kyu Shin, Technical Manager
LTA Co., Ltd.



NVLAP LAB CODE 200723-0

TEST REPORT

This laboratory is accredited by Radio Research Laboratory and National Voluntary Laboratory Accreditation Program.
The tests reported herein have been performed in accordance with its terms of accreditation.

Test Report No. : LR500111708R
Issue Date : August 24, 2017
Applied Standard : FCC Part 15, Subpart B and ICES-003
Trade Name : Hanwha Techwin Co., Ltd.
Category : NETWORK CAMERA
Model Name : XNB-6001N
Additional Model name : -
Serial Number : Identification

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	24.08.2017	LR500111708R	Initial

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LTA Certification

Applicant / Manufacture

Company name : Hanwha Techwin Co., Ltd.
Address : 1204, Changwon-daero, Seongsan-gu, Chang-won-si, Gyeongsangnam-do, korea
Telephone /Facsimile : +82-70-7147-8361

Factory

Company name : Hanwha Techwin (Tianjin) Co., Ltd.
Address : No.11 Weiliu Rd, Micro-Electronic Industrial Park, TEDA, Tianjin, 300385, People's Republic of China

Equipment Under Test (EUT)

Category : NETWORK CAMERA
Brand : Hanwha Techwin Co., Ltd.
Model name : XNB-6001N
Serial number : -
Intended environment : Industrial area
Date of receipt : August 07, 2017
EUT condition : Pre-production, not damaged
Operating Mode : Operating mode
Interface ports : DC IN, LAN (Network), Micro USB, Audio IN/OUT, POE (CAM), VIDEO, ALARM, Micro SD
Power rating : DC 12 V
Test memory size : -
Crystal/Oscillator(s) : -
Firmware version : XXXX

Model Description

- NONE

Model Specification

- NONE

*** To be continued next page ***

LTA Certification –cont.-

Test Performed

Test started & completed : August 18, 2017
Location : LTA Co., Ltd.

Test Specification

Purpose of the test : Compliance test to the following standard
Applied standard : FCC Part 15, Subpart B and ICES-003
Classification : Class A
Deviations from Standard : N/A
Test Method

Test Results

Measurement	Results*	Test method
Radiated disturbance	Complies	ANSI C 63.4-2014
Conducted disturbance	Not Applicable	ANSI C 63.4-2014

* : The compliance statement is based on nominal value only.

Modification performed by the lab.:

- N.A

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

Laboratory's Certificate

Report number : LR500111708R
Issue date : August 24, 2017

This test report is issued under the authority of:

The test was supervised by:



Young Kyu Shin, Technical Manager



Hyo Joon Kang , Test Engineer

The results in this report apply only to the sample(s) tested.

It is not allowed to copy this report even partly without the allowance of the test laboratory.

General information's

Purpose

This document is based on the Electromagnetic Interference (EMI) tests performed on the “XNB-6001N”. The measurements were performed according to the measurement procedure described in ANSI C 63.4-2014. The tests were carried out in order to confirm whether the electromagnetic emissions from the EUT(Equipment Under Test), are within the class A limits defined in FCC Part 15, Subpart B- “Section 15.107- Conducted limits” and “Section 15.109-Radiated emission limits”.

Test Performed

Company name : LTA Co., Ltd.
 Address : 243, Jubug-ri, Yangji-Myeon, Youngin-Si, Kyunggi-Do, Korea. 449-822
 Telephone : +82-31-323-6008
 Facsimile : +82-31-323-6010

Measurement uncertainty

Radiated disturbance (30 to 1000MHz) : +3.94 [dB] , -3.94 [dB] (k=2)
 (1GHz to 18GHz) : +3.46 [dB] , -3.46 [dB] (k=2)
 Conducted disturbance (0.15 to 30MHz) : +1.46[dB] , -1.46 [dB] (k=2)

The coverage factor k=2 yields approx. a 95% level of confidence for near-normal distribution typical of most measurement results.

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	2017-09-30	ECT accredited Lab.
RRA	KOREA	KR0049	-	EMC accredited Lab.
FCC	U.S.A	649054	2019-04-13	FCC CAB
VCCI	JAPAN	R-2133(10 m), C-2307	Updating	VCCI registration
VCCI	JAPAN	T-2009	2017-12-23	VCCI registration
VCCI	JAPAN	G-847	2018-12-13	VCCI registration
IC	CANADA	5799A-1	2019-11-07	IC filing
KOLAS	KOREA	NO.551	Updating	KOLAS accredited Lab.

Brief Information

1-1 Test Summary

Parameter	Applied Standard	Status (note 1)
I. Emission		
Radiated disturbance	FCC Part 15.109 / ICES-003 Clause 6.2	C
Conducted disturbance	FCC Part 15.107 / ICES-003 Clause 6.1	N/A
Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable * The data in this test report are traceable to the national or international standards.		

Frequency range to be scanned:

0.15 MHz - 30 MHz as conducted measurement

5th harmonic of the highest frequency or 40 GHz, whichever is lower

Bandwidth:

Measured by the CISPR quasi-peak function Bandwidth is 9 kHz in the frequency 0.15 MHz to 30 MHz and 120 kHz in the frequency 30 MHz to 6,000 MHz.

Measured by the CISPR Peak function Bandwidth is 1MHz in the frequency 1 GHz to 40 GHz.

A sample calculation:

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

Emission Level= meter reading + COR.F

1-2 Variant Model

- NONE

1-3 Operating mode of the EUT

The tests have been conducted with the following operational mode(s) of the EUT.

Name of mode in the report

Description

Operating mode

:

Operating mode

1-4 Modification

None

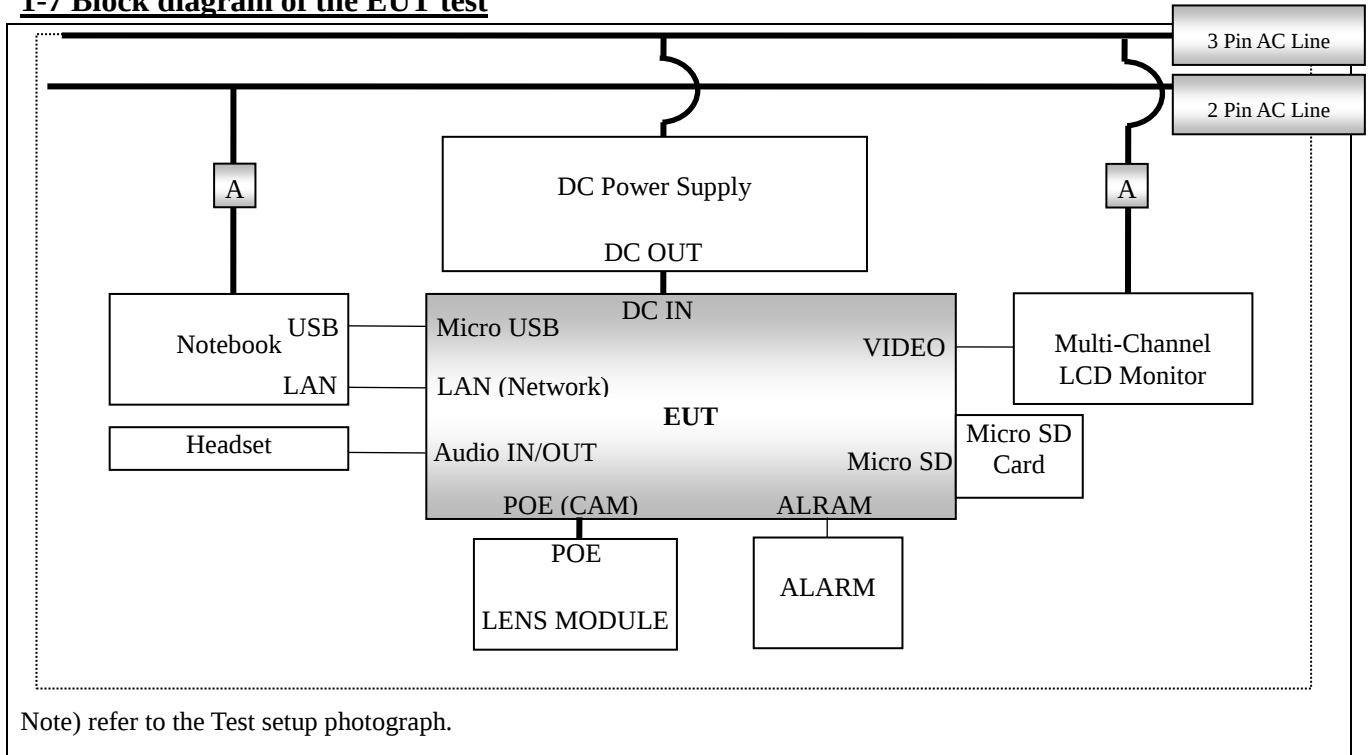
1-5 List of EUT and accessory

EUT				
Category	Model Name	Serial No.	Manufacturer	Remarks
NETWORK CAMERA	XNB-6001N	N/A	Hanwha Techwin (Tianjin) Co., Ltd.	—
ACCESSORY				
Category	Model Name	Serial No.	Manufacturer	Remarks
LENS MODULE	SLA-T4680V	N/A	Hanwha Techwin (Tianjin) Co., Ltd.	-
Notebook	PP37L	N/A	DELL	-
ALARM	N/A	N/A	N/A	-
Headset	SHS-100VB	N/A	SAMSUNG	-
DC Power Supply	N/A	N/A	N/A	-
MICRO SD Card	N/A	N/A	N/A	-
Multi-Channel LCD Monitor	RPM-501A	501GW10070	POSTIUM	-

1-6 Cable List

Cable List				
Type	Length (m)	Shielding (Cable/backshell)	Remarks	
			From	to
DC Power Supply	1.5	NO/NO	DC IN	DC OUT
Notebook	3.0	NO/NO	LAN (Notebook)	LAN
Notebook	1.2	NO/NO	Micro USB	USB
Headset	2.0	NO/NO	Audio IN/OUT	Audio IN/OUT
LENS MODULE	8.0	NO/NO	POE (CAM)	POE
Multi-Channel LCD Monitor	1.0	NO/NO	VIDEO	BNC
ALRAM	0.2	NO/NO	ALRAM	ALRAM
Micro SD Card	-	-	Micro SD	-
AC Power Source	1.5	NO/NO	AC IN	3 Pin AC Line
Adapter	1.5	NO/NO	DC IN	DC OUT
Adapter	1.5	NO/NO	DC IN	DC OUT

1-7 Block diagram of the EUT test



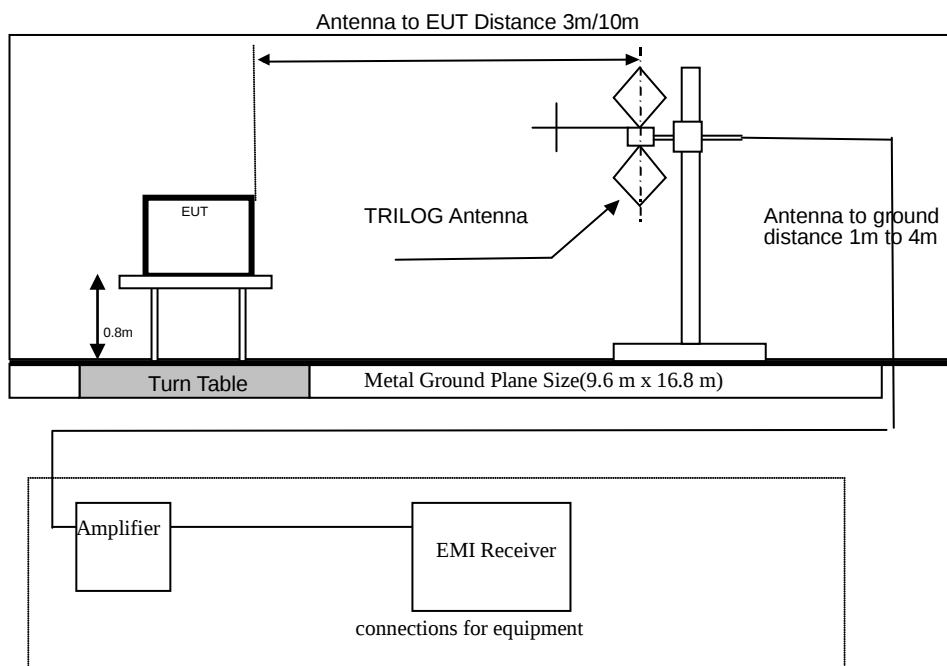
2- Test Site Description

1-Facility

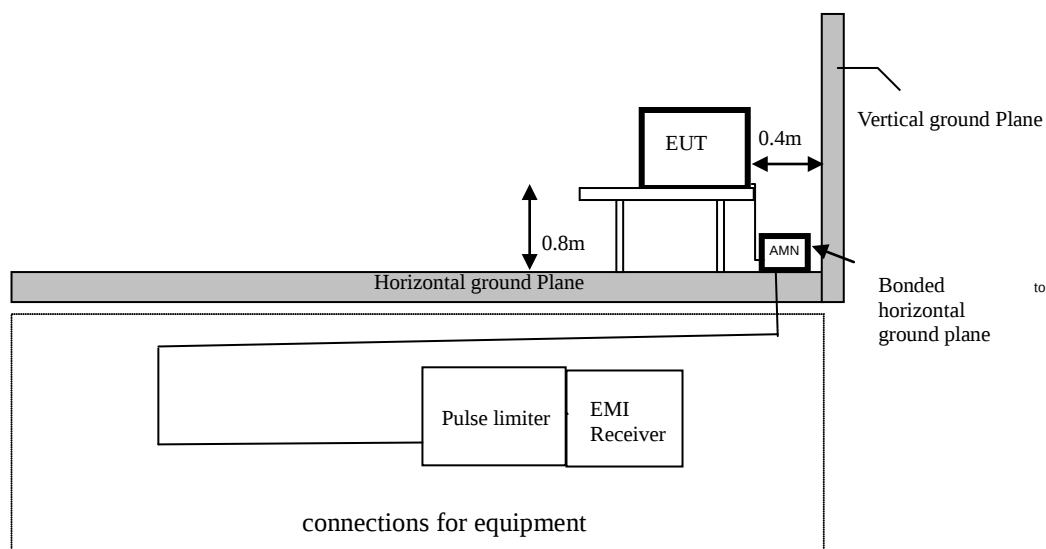
All the testing facilities are periodically serviced as a daily check for equipment and cables systems, an every 6 months facility check for the facilities and a monthly check and annual calibration for testing equipment according to ISO/IEC 17025. All the testing facilities are used as the same specifications shown below. There are descriptions both for radiated disturbance measurement and conducted disturbance measurement conformed by ANSI C 63.4-2014.

The NSA measurement of the 10 m Chamber was performed on February 17, 2017 according to ANSI C 63.4:2014

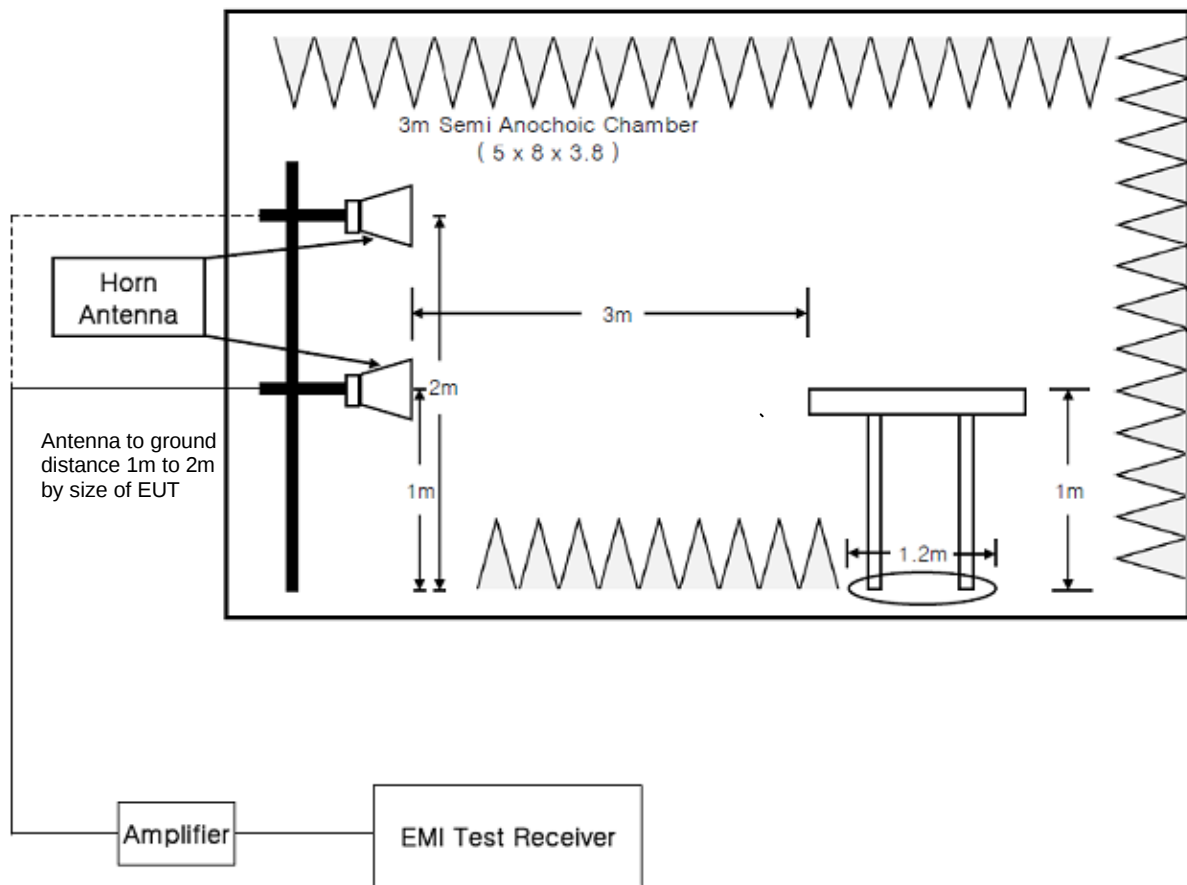
2-1 Radiated Disturbance Measurement – Below 1GHz



2-2 Conducted Disturbance Measurement



2-3 Radiated Disturbance Measurement – Above 1GHz



3- Test Procedure

3-1 Radiated Disturbance Measurements – Below 1GHz

- Test site is met the requirements of ANSI C 63.4-2014 and the distance between the EUT and the antenna is adjusted 3 m/10 m.
- The turntable can be rotated 360 degrees.
- The antenna can be adjusted between 1m and 4m in height above the ground.
- The EUT is placed on the non-conducting table with 0.8m height on the turntable.
- Measurements are carried out using a EMI test receiver with peak detectors (100 kHz bandwidth) and an EMI receiver with quasi-peak detectors(120 kHz bandwidth).
- Refer to the list of test equipment used for the test.
- TRILOG antenna are used as wideband antenna.
- The TRILOG antenna is used in the frequency range of 30 MHz to 1 000 MHz, the Horn antenna is used in the frequency range of 1GHz to 18 GHz.
- A variable attenuator is used for verifying amplifier's linearity.
- Rotating the turntable and adjusting the height of the antenna are carried out by control buttons on the console.
- Refer to "Brief Information"(page 7-10) about details of the EUT and configuration of the cables.

- Measurement is carried out by a LTA operator as manual operation.
 - searching for some of High disturbance frequency points than the other points with the following settings; bandwidth 100 kHz, frequency range 10 MHz between 30MHz and 300 MHz and frequency range 50 MHz between 300 MHz and 1 GHz.
 - searching the worst direction with the maximum level of the disturbance wave in rotating the turntable 360 degrees at each searched frequency point.
 - setting the height of the antenna with the maximum level of the disturbance wave from 1m to 4m.
 - reading the disturbance level by the EMI receiver with quasi-peak detectors (120 kHz bandwidth) according to ANSI C 63.4-2014.
 - measuring to vertical and horizontal polarization.
 - calculating the measurement result with the following formula or equation:
(Measurement result= measured value + antenna factor + antenna cable loss)

3-2 Conducted Disturbance Measurements

- The measurement is carried out on an open site with horizontal and metallic ground plane.
- An AMN(Artificial Mains Network) with a nominal impedance ($50\ \Omega/50\ \mu\text{H}$) as defined in ANSI C 63.4-2014., shall be utilized.
- The AMN is grounded on a horizontal metal ground plane.
- Measurement is carried out using an EMI receiver with quasi-peak detectors and average detector.
(Refer to the List of test equipment used for the test.)
- The shortest distance between the EUT and the AMN is 0.8m.
- The EUT is placed on the non-conducting table with 0.8m height.
- A remote switch is used for changing phases between Line (L) and Neutral (N).
- Refer to "Brief Information"(page 7-10) about details of the EUT and configuration of the cables.

- Measurement is carried out as manual operation.
 - detecting the maximized emission level using the maxhold function after setting the spectrum analyzer bandwidth 1KHz and the frequency range from 150 kHz to 1 MHz , 1 MHz to 5 MHz and 5 MHz to 30 MHz.
 - searching the maximum frequency point of the disturbance wave in each frequency range.
 - reading the disturbance level of quasi-peak, average and Line (L) and Neutral (N) in 9 kHz bandwidth by the EMI receiver.
 - calculating the measurement result with the following formula or equation.
(Result = Reading + Cor.F.)
(Margin = Limit- Result)

3-3 Radiated Disturbance Measurements – Above 1GHz

- Test site is met the requirements of ANSI C 63.4-2014 and the distance between the EUT and the antenna is adjusted 3m.
- The turntable can be rotated 360 degrees.
- The antenna can be adjusted between 1m in height above the ground.
- The EUT is placed on the non-conducting table with 1m height on the turntable.
- Measurements are carried out using a EMI test receiver with peak detectors (1 MHz bandwidth) and an EMI receiver with peak and average detectors(1 MHz bandwidth).
- Refer to the list of test equipment used for the test.
- HORN antenna are used as wideband antenna.
- The HORN antenna is used in the frequency range of 1 GHz to 18 GHz.
- A variable attenuator is used for verifying amplifier's linearity.
- Rotating the turntable and adjusting the height of the antenna are carried out by control buttons on the console.
- Refer to "Brief Information"(page 7-10) about details of the EUT and configuration of the cables.
- Measurement is carried out by a LTA operator as manual operation.
 - searching the worst direction with the maximum level of the disturbance wave in rotating the turntable 360 degrees at each searched frequency point.
 - setting the height of the antenna with the maximum level of the disturbance wave from 1 m
 - reading the disturbance level by the EMI receiver with peak and average detectors (1MHz bandwidth) according to ANSI C 63.4-2014.
 - measuring to vertical and horizontal polarization.
 - calculating the measurement result with the following formula or equation:
(Measurement result= measured value + antenna factor + antenna cable loss)

4- List of Equipment Used For the Tests

	Item	Model Name	Serial No.	Manufacturer	Interval	Last Cal.
1	EMI TEST Receiver	ESR	101499	Rohde & Schwarz	1 year	Jul-17
2	Pulse Limiter	ESH3-Z2	100710	Rohde & Schwarz	1 year	Mar-17
3	DIGITAL THERMO HYGROMETER	TH-611	NONE	BODYCOM	1 year	Sep-16
4	DTV Signal Generator	MFG-100	15M2002	MFLO	1 year	Mar-17
5	Color TV Pattern Generator	PM-5518-TX	LO5333	Philips	-	-
6	LISN	ESH3-Z6	100378	Rohde & Schwarz	1 year	Sep-16
7	LISN(main)	ESH3-Z5	893045/017	Rohde & Schwarz	1 year	Mar-17
8	LISN(sub)	ENV216	100408	Rohde & Schwarz	1 year	Sep-16
9	ISN	ISN T800	27109	TESEQ	1 year	Jan-17
10	ISN	ENY81-CA6	101565	Rohde & Schwarz	1 year	Jan-17
11	CURRENT PROBE	EZ-17	100508	Rohde & Schwarz	1 year	Jan-17
12	LISN	ESH3-Z6	100378	Rohde & Schwarz	1 year	Sep-16
13	EMI TEST Receiver	ESC17	100772	Rohde & Schwarz	1 year	Sep-16
14	Amplifier (25 dB)	8447D	2944A07974	HP	1 year	Sep-16
15	DIGITAL THERMO HYGROMETER	TESTEK-303A	TAEGUANG	-	1 year	Mar-17
16	Log.-Per. Antenna	VULP 9118	9118 A 401	SCHWARZBECK	2 year	Apr-17
17	Biconical Antenna	VHA 9103	VHA 9103- 2315	SCHWARZBECK	2 year	Apr-17
18	TRILOG Antenna	VULB9160	9160-3237	SCHWARZBECK	2 year	May-17
19	TRILOG Antenna	VULB9160	9160-3237	SCHWARZBECK	2 year	Apr-17
20	Amplifier (25 dB)	8449B	3008A00337	HP	1 year	Mar-17
21	Spectrum Analyzer (~ 26.5 GHz)	E4407B	MY45108946	Agilent	1 year	Mar-17
22	HORN ANTENNA	3115	114105	ETS	2 year	May-16
23	HORN ANTENNA	3115	114105	ETS	2 year	Jul-16
24	TRILOG Antenna	VULB9268	775	SCHWARZBECK	2 year	Mar-17
25	HORN ANTENNA	3115	000550005	ETS	2 year	May-17
26	TEST PROGRAM	e3_Ver:6.2009-10- 12a	-	AUDIX	-	-

5-1 Radiated Disturbance Measurements (Below 1GHz) / 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. : XNB-6001N

Temp/Humi: 27 / 56

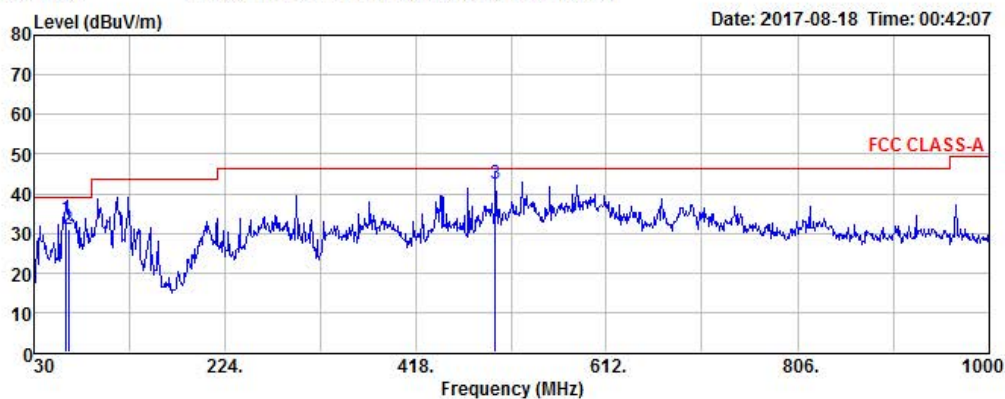
Test Mode : Operating mode

Tested by: KANG H J

Data: 1272

File: C:\Program Files (x86)\e3\1708-1.EM6 (1610)

Date: 2017-08-18 Time: 00:42:07



Freq MHz	Reading dBuV	C.F dB	Result QP dBuV/m	Limit dBuV/m	Margin dB	Height cm	Angle deg	Polarity
62.98	48.65	-14.85	33.80	39.00	5.20	102	167	VERTICAL
64.92	46.33	-15.17	31.16	39.00	7.84	103	209	VERTICAL
499.48	49.02	-6.65	42.37	46.40	4.03	109	214	VERTICAL

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

-Continue
(Below 1GHz) / H



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. : XNB-6001N

Temp/Humi: 27 / 56

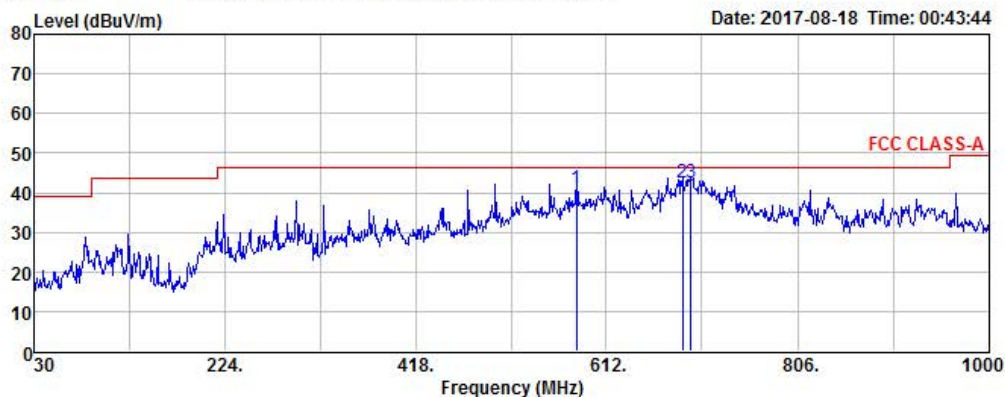
Test Mode : Operating mode

Tested by: KANG H J

Data: 1273

File: C:\Program Files (x86)\e3\1708-1.EM6 (1610)

Date: 2017-08-18 Time: 00:43:44



Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Polarity
MHz	dBuV	dB	QP dBuV/m	dBuV/m	dB	cm	deg	
581.93	45.50	-4.66	40.84	46.40	5.56	161	52	HORIZONTAL
689.60	45.17	-2.86	42.31	46.40	4.09	310	235	HORIZONTAL
698.33	45.33	-2.74	42.59	46.40	3.81	389	121	HORIZONTAL

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

**-Continue
(Above 1GHz)**

EUT/Model No.: XNB-6001N

Temp/Humi: 25 / 57

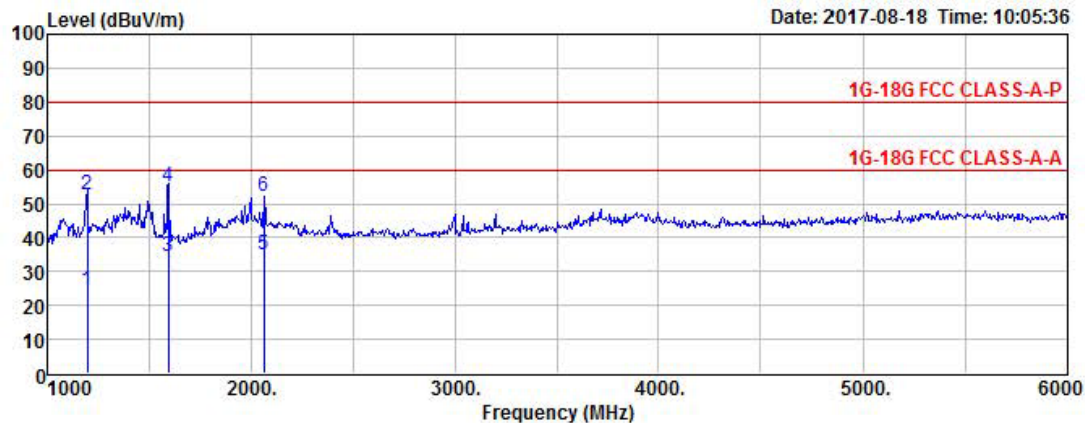
Test Mode : Operating mode

Tested by: KANG H J

Data: 1284

File: C:\Program Files (x86)\e3\1708-1.EM6 (1610)

Date: 2017-08-18 Time: 10:05:36



EUT/Model No.: XNB-6001N

Temp/Humi: 25 / 57

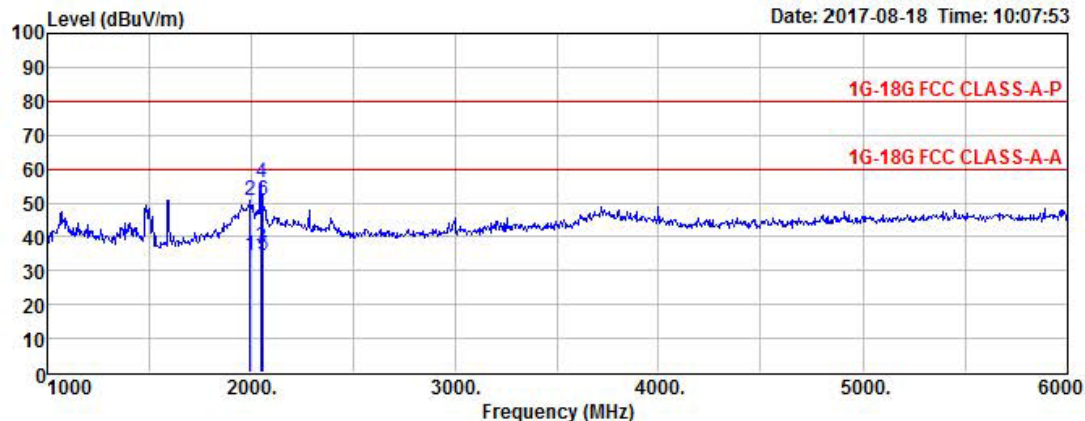
Test Mode : Operating mode

Tested by: KANG H J

Data: 1285

File: C:\Program Files (x86)\e3\1708-1.EM6 (1610)

Date: 2017-08-18 Time: 10:07:53



Manufacture : Hanwha Techwin Co., Ltd.

Test Date

Temp.: 25
[°C]

Humidity : 57
[%]

Distance (m)
4.5

Model : XNB-6001N

2017-08-18

TEST mode : Operating mode

Ver Data: 1284

Hor Data: 1285

Freq.(MHz)	Reading(PK)	Reading(AV)	C.F	Result(PK)	Result(AV)	Limit(PK)	Limit(AV)	Margin(PK)	Margin(AV)	Height	Angle	Polarity
MHz	dBuV	dBuV	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	cm	deg	Hor/Ver
1995.0	55.0	38.4	-0.66	54.30	37.76	80.0	60.0	25.70	22.24	345	281	H
2050.0	59.6	40.6	-0.25	59.30	40.36	80.0	60.0	20.70	19.64	284	110	H
2060.0	54.4	38.1	-0.2	54.21	37.92	80.0	60.0	25.79	22.08	228	182	H
1195.0	62.4	33.9	-6.05	56.34	27.87	80.0	60.0	23.66	32.13	100	92	V
1595.0	62.5	42.0	-4.02	58.49	37.99	80.0	60.0	21.51	22.01	136	86	V
2065.0	55.6	38.8	-0.18	55.46	38.60	80.0	60.0	24.54	21.40	127	104	V

TEST EQUIPMENT USED: 13, 20, 25, 26

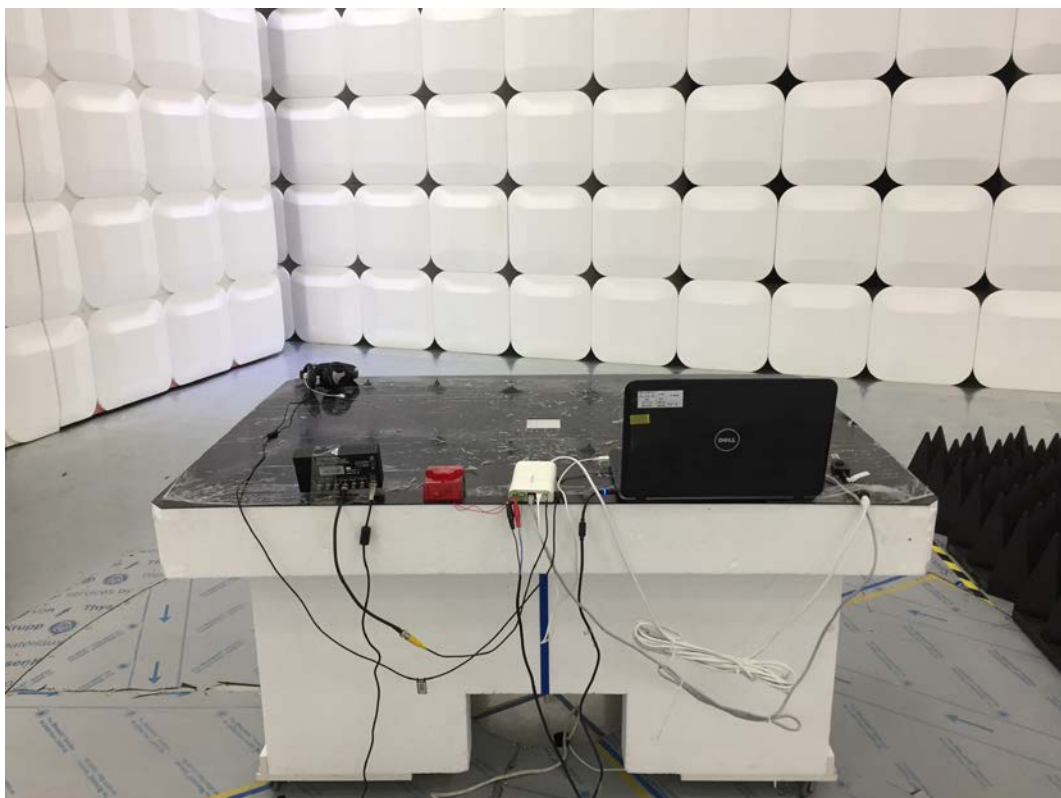
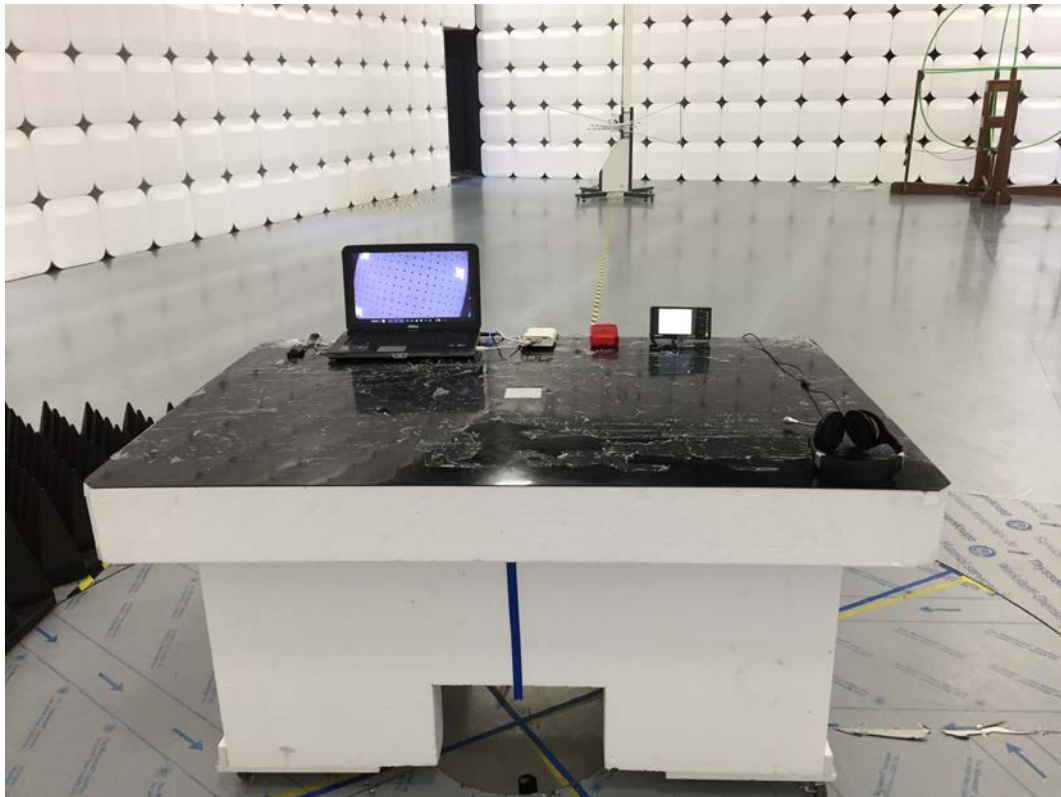
Conclusions

Product models "**XNB-6001N**" meets all of the Class A requirements of the FCC Part 15, Subpart B. Limits of radio disturbance characteristics of ITE).

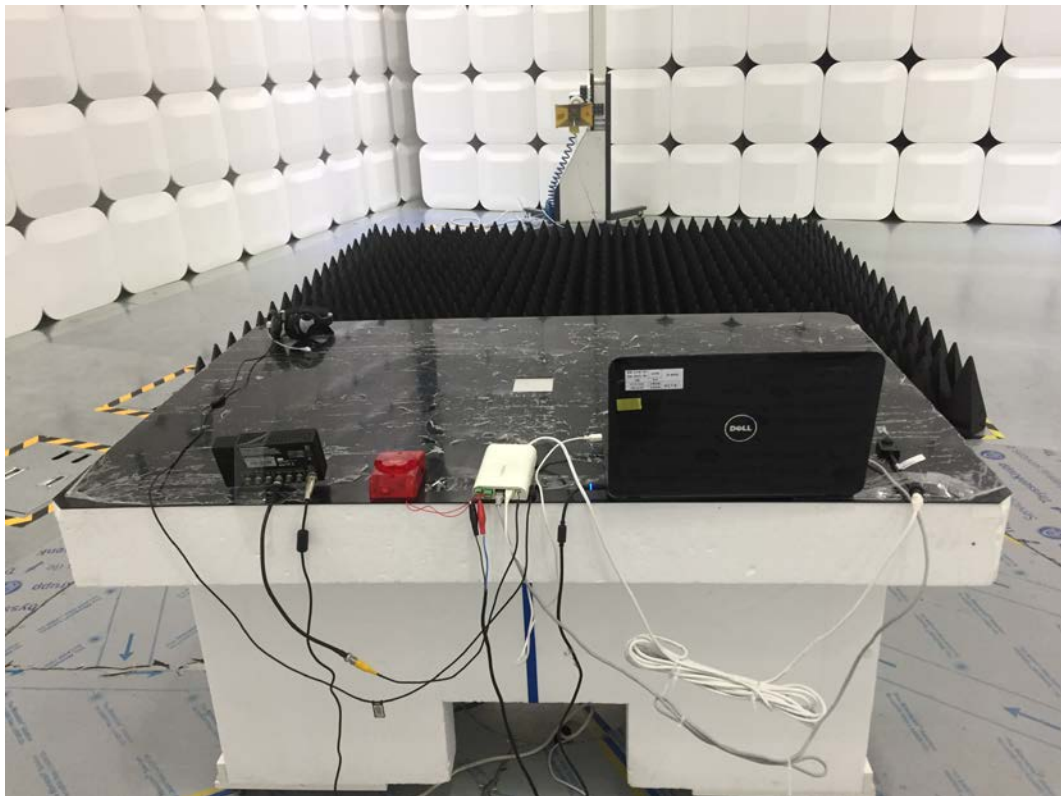
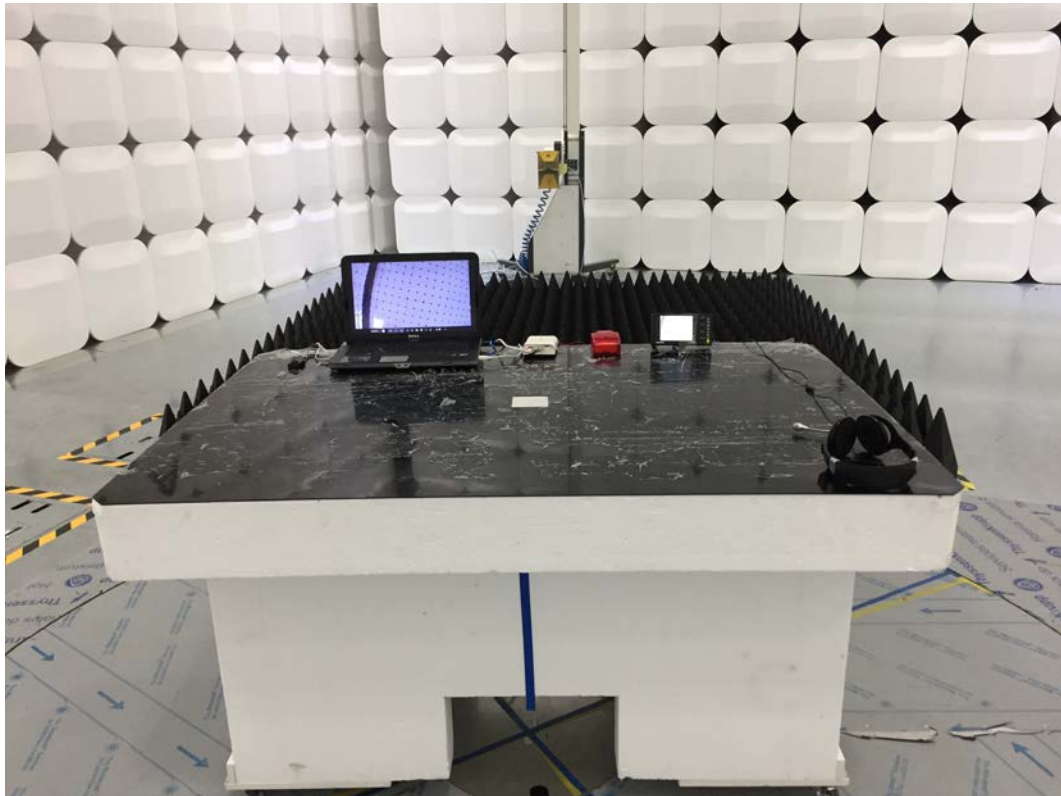
(Refer to Test Specification and Test Results in the "LTA certification", page4 and 5.)

- Operating mode: The highest internal source of an EUT is Above 108 MHz, the measurement shall only be made up to 6 GHz.(The highest internal source of an EUT : Above 108 MHz)

Photograph of the Radiated Disturbance Measurements (Below 1GHz)



Photograph of the Radiated Disturbance Measurements (Above 1GHz)



Photograph of the Equipment Under Test

