

ELECTROMAGNETIC EMISSION COMPLIANCE REPORT

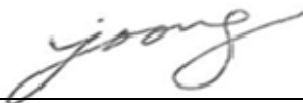
Test Report No. : OT-192-RED-107
AGR No. : A191A-203
Applicant : KSS-ImageNext Co., Ltd.
Address : A-7th Floor, Woolim Lion's Valley 2, 14,Sagimakgol-ro, 45beon-gil, Jungwon-gu, Seongnam-si, Gyeonggi-do, 13220, Republic of Korea
Manufacturer : KSS-ImageNext Co., Ltd.
Address : A-7th Floor, Woolim Lion's Valley 2, 14,Sagimakgol-ro, 45beon-gil, Jungwon-gu, Seongnam-si, Gyeonggi-do, 13220, Republic of Korea
FCC ID. : 2ASO6-INO-8000
Type of Equipment : HDNS AVM
Model Name : INO-8000
Multiple Model Name : Refer to section 3.2
Serial number : N/A
Total page of Report : 30 pages (including this page)
Date of Incoming : December 19, 2018
Date of Issuing : February 25, 2019

SUMMARY

The equipment complies with the requirement of **FCC CFR 47 PART 15 SUBPART B Class A, Section 15.101.**

This test report contains only the results of a single test of the sample supplied for the examination.

It is not a general valid assessment of the features of the respective products of the mass-production.

Reviewed by: 
 Hee-Joong, Kim / General Manager
 ONETECH Corp.

Approved by: 
 Gea Won, Lee / Managing Director
 ONETECH Corp.

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Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-192-RED-107	February 25, 2019	Initial Release	All

1. VERIFICATION OF COMPLIANCE

-. APPLICANT : KSS-ImageNext Co., Ltd.

-. ADDRESS : A-7th Floor, Woolim Lion's Valley 2, 14,Sagimakgol-ro, 45beon-gil, Jungwon-gu, Seongnam-si, Gyeonggi-do, 13220, Republic of Korea

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-. Factory : KSS-ImageNext Co., Ltd.

-. ADDRESS : A-7th Floor, Woolim Lion's Valley 2, 14,Sagimakgol-ro, 45beon-gil, Jungwon-gu, Seongnam-si, Gyeonggi-do, 13220, Republic of Korea

-. MODEL NAME : INO-8000

-. SERIAL NUMBER : N/A

-. BRAND/TRADE NAME : N/A

-. DATE : February 25, 2019

EQUIPMENT CLASS	Part 15 Class A Digital Device
E.U.T. DESCRIPTION	HDNS AVM
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.4: 2014
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
STANDARDS	FCC Part 15, Section 15.101 (CLASS A)
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	None
FINAL TEST WAS CONDUCTED ON	10 m Semi anechoic chamber

ONETECH Corp. tested the above equipment in accordance with the requirements set forth in the above standard. The test results show that equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

2. TEST SUMMARY

2.1 Test items and results

SECTION	TEST ITEMS	RESULTS
15.107	Conducted Emission Limits	N/A (Note.1)
15.109	Radiated Emission Limits	Met the Limit / PASS

Note 1. This test was not performed the because of the EUT is DC product.

3. GENERAL INFORMATION

3.1 Product Description

The KSS-ImageNext Co., Ltd., Model INO-8000 (referred to as the EUT in this report) is a HDNS AVM. Product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Plastic
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1 MHz)	20 MHz, 27 MHz, 8 MHz
ELECTRICAL RATING	DC 12 V/ 24 V (Typ), Max 1.5A (12 V)/ MAX 0.75 A (24 V)
NUMBER OF PCB LAYERS (P. C. BOARD NAME)	8 Layers
EXTERNAL CONNECTOR	MAIN, SUB, CAMERA IN, VIDEO OUT, USB

3.2 Model Differences

-. The following lists consist of the added model and their differences.

Model Name	Differences	Tested
INO-8000	Basic Model	☒
INO-8010, INO-8020, INO-8030, INO-8040, INO-8050, INO-8060, INO-8070, INO-8080, INO-8090, INO-8100, INO-8110, INO-8120, INO-8130, INO-8140, INO-8150, INO-8160, INO-8170, INO-8180, INO-8190, INO-8200, INO-8210, INO-8220, INO-8230, INO-8240, INO-8250, INO-8260, INO-8270, INO-8280, INO-8290, INO-8300, INO-8310, INO-8320, INO-8330, INO-8340, INO-8350, INO-8360, INO-8370, INO-8380, INO-8390, INO-8400, INO-8410, INO-8420, INO-8430, INO-8440, INO-8450, INO-8460, INO-8470, INO-8480, INO-8490, INO-8500, INO-8510, INO-8520, INO-8530, INO-8540, INO-8550, INO-8560, INO-8570, INO-8580, INO-8590, INO-8600, INO-8610, INO-8620, INO-8630, INO-8640, INO-8650, INO-8660, INO-8670, INO-8680, INO-8690, INO-8700, INO-8710, INO-8720, INO-8730, INO-8740, INO-8750, INO-8760, INO-8770, INO-8780, INO-8790, INO-8800, INO-8810, INO-8820, INO-8830, INO-8840, INO-8850, INO-8860, INO-8870, INO-8880, INO-8890, INO-8900, INO-8910, INO-8920, INO-8930, INO-8940, INO-8950, INO-8960, INO-8970, INO-8980, INO-8990	The model is similar to the basic model except for the software only. According to Client's request, each Software has difference like the size of view, displayed location, displayed contents, Operation Scenario, indicator and Client's UI. These additional models are electrically identical to basic model.	☐

3.3 Related Submittal(s) / Grant(s)

Original submittal only

3.4 Test System Details

The model numbers for all the equipments, which were used in the tested system, is:

Model	Manufacturer	Description	Connected to
HDNS AVM	KSS-ImageNext Co., Ltd.	INO-8000	-
Camera (4 ea)	KSS-ImageNext Co., Ltd.	N/A	EUT (Main)
Remote Controller	KSS-ImageNext Co., Ltd.	N/A	EUT (Main)
Monitor 1	CAMOS	CM-720TA	EUT (Main)
Monitor 2	SAMSUNG	PM24KO	EUT (Main)

3.5 Test Methodology

The radiated testing was performed according to the procedures in ANSI C63.4: 2014. Radiated testing was performed at a distance of 10 m from EUT to the antenna.

3.6 Test Facility

The Onetech Corp. has been designated to perform equipment testing in compliance with ISO/IEC 17025.

The Electromagnetic compatibility measurement facilities are located at:

- 1) 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea
- 2) 12-5, Jinsaegol-gil 75 beon-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea

-. Site Filing:

VCCI (Voluntary Control Council for Interference) – Registration No. R-4112/ C-14617/ G-10666/ T-1842

IC (Industry Canada) – Registration No. Site# 3736A-3

-. Site Accreditation:

KOLAS (Korea Laboratory Accreditation Scheme) - Accreditation NO. KT085

FCC (Federal Communications Commission) - Accreditation No. KR0013

RRA (Radio Research Agency) – Designation No. KR0013

4. SYSTEM TEST CONFIGURATION

4.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
MAIN BOARD	N/A	N/A	N/A

4.2 Mode of operation during the test

- Checked the video output state after the EUT was connected to monitor.
- Input power condition during the measurements was DC 12 V, DC 24 V.

4.3 Cable Description

Ports Name	Shielded	Ferrite Bead	Metal Shell	Length (m)	Connected to
MAIN	N	N	N	2.0	DC Source
SUB	N	N	N	2.0	Remote Controller(EUT)
VIDEO OUT	N	N	N	2.0	Monitor 1 (EUT)
VIDEO OUT	N	N	N	2.0	Monitor 2 (EUT)
CAMERA IN	N	N	N	2.0	Camera 4 ea (EUT)

4.4 Equipment Modifications

- None.

4.5 Configuration of Test System

Radiated Emission Test: Preliminary radiated emission test was conducted using the procedure in ANSI C63.4: 2014 8.3.1.1 to determine the worse operating conditions. Final radiated emission test was conducted at 10 m semi anechoic chamber.

5. PRELIMINARY TEST

5.1 Radiated Emission Test

During Preliminary Test, the following operating mode was investigated.

Operation Mode	The Worst operating condition (Please check one only)
Normal operating	X

6. FINAL RESULT OF MEASUREMENT

Exploratory measurement was done in normal operation mode. And the final measurement was selected for the maximized emission level.

6.1 Radiated Emission Test

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

6.1.1 Operating Environment

Temperature : 22.4 °C
Relative humidity : 50.3 % R.H.

6.1.2 Test Setup

The radiated emissions measurements were on the 10 m, in 10 m semi anechoic chamber. The photocopier that the EUT has been inserted in was placed on an insulator above the ground plane.

The frequency spectrum from 30 MHz to 1 000 MHz was scanned and maximum emission levels maximized at each frequency recorded. The system was rotated 360°, and the antenna was varied in the height between 1.0 m and 4.0 m in order to determine the maximum emission levels. This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

6.1.3 Measurement uncertainty

Radiated emission electric field intensity, 30 MHz ~ 1 000 MHz : 4.50 dB

Measurement uncertainty is calculated in accordance with CISPR 16-4-2. The measurement uncertainty is given with a confidence of 95 % with the coverage factor, $k = 2$.

6.1.4 Limit (Class A)

Frequency of Emission (MHz)	Resolution bandwidth	Field strength @ 3 m (dBμV/m)	Field strength @ 3 m (μV/m)
30 ~ 88 88 ~ 216 216 ~ 960 960 ~ 1 000	120 kHz	Quasi-peak	
		40.0	100
		43.5	150
		46.0	200
		54.0	500
> 1 000	1 MHz	Peak Limit	CISPR Average Limit
		74.0	54.0

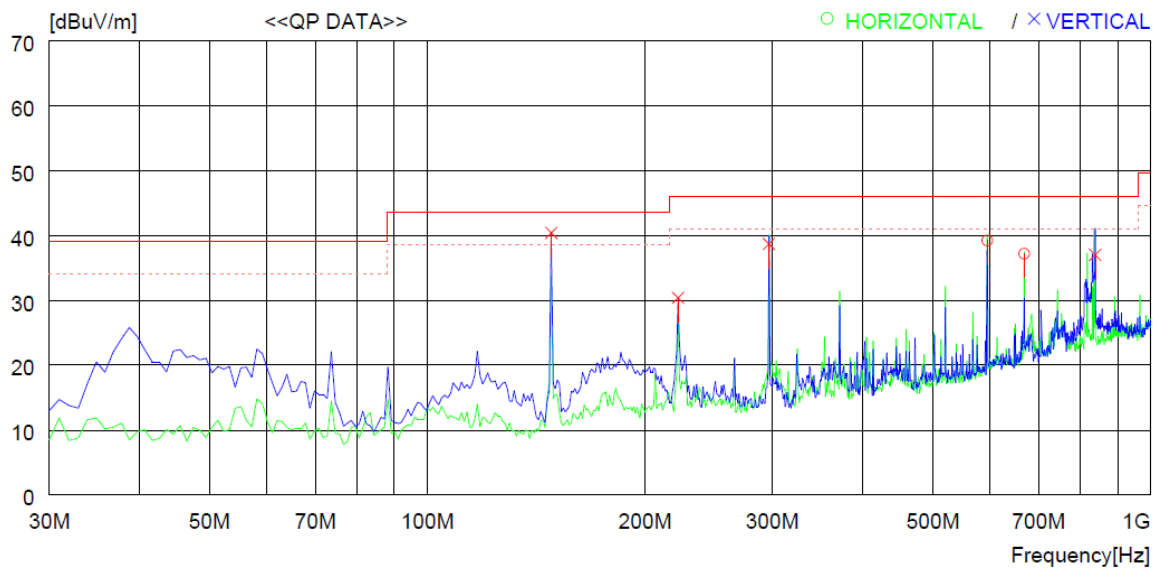
*Alternative to Limits for radiated disturbance of CISPR22 class A ITE at a measuring distance of 10 m

Frequency of Emission (MHz)	Resolution bandwidth	Field strength @ 10 m (dB μ V/m)	Field strength @ 10 m (μ V/m)
30 ~ 88 88 ~ 216 216 ~ 960 960 ~ 1 000	120 kHz	Quasi-peak	
		39.1	90
		43.5	150
		46.4	210
		49.5	300
> 1 000	1 MHz	Peak Limit	CISPR Average Limit
		74.0	54.0

6.1.5 Test data for DC 12 V

Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (b)
Type of Test : CLASS A
Result : PASSED BY 3.1 dB at 148.340 MHz

EUT : INO-8000 Date: February 18, 2019
Frequency Range : 30 MHz ~ 1 000 MHz
Detector : Q.P (6 dB Bandwidth: 120 kHz)
Distance : 10 m



No.	FREQ	READING	ANT	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	FACTOR	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal -----										
1	594.538	47.7	19.2	5.6	33.3	39.2	46.0	6.8	200	238
2	668.256	45.0	19.6	5.9	33.3	37.2	46.0	8.8	100	0
----- Vertical -----										
3	148.340	62.4	8.1	2.9	33.0	40.4	43.5	3.1	100	89
4	222.060	48.4	11.5	3.4	32.9	30.4	46.0	15.6	100	82
5	296.750	54.2	13.5	4.0	33.0	38.7	46.0	7.3	100	359
6	838.001	41.7	21.3	6.8	32.8	37.0	46.0	9.0	100	359

Remark: Margin (dB) = Limit – Result and Result = Reading Quasi-Peak + Antenna Factor + Loss – Gain

Loss and Gain in above table means Cable Loss and Pre-amplifier gain.

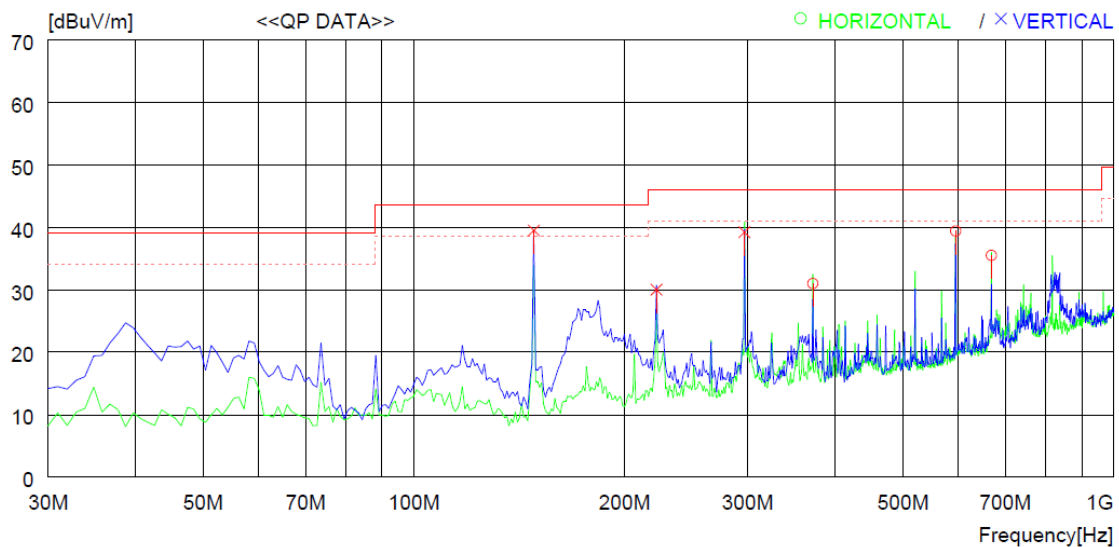


Tested by: Chang-Ho, Lee / Engineer

6.1.2 Test data for DC 24 V

Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (b)
Type of Test : CLASS A
Result : PASSED BY 4.0 dB at 148.340 MHz

EUT : INO-8000 Date: February 18, 2019
Frequency Range : 30 MHz ~ 1 000 MHz
Detector : Q.P (6 dB Bandwidth: 120 kHz)
Distance : 10 m



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	371.440	44.5	15.0	4.5	33.0	31.0	46.0	15.0	300	329
2	594.538	47.9	19.2	5.6	33.3	39.4	46.0	6.6	200	231
3	668.256	43.3	19.6	5.9	33.3	35.5	46.0	10.5	100	189
----- Vertical -----										
4	148.340	61.5	8.1	2.9	33.0	39.5	43.5	4.0	200	0
5	222.060	48.0	11.5	3.4	32.9	30.0	46.0	16.0	100	359
6	296.750	54.7	13.5	4.0	33.0	39.2	46.0	6.8	100	168

Remark: Margin (dB) = Limit – Result and Result = Reading Quasi-Peak + Antenna Factor + Loss – Gain

Loss and Gain in above table means Cable Loss and Pre-amplifier gain.



Tested by: Chang-Ho, Lee / Engineer

7. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses.

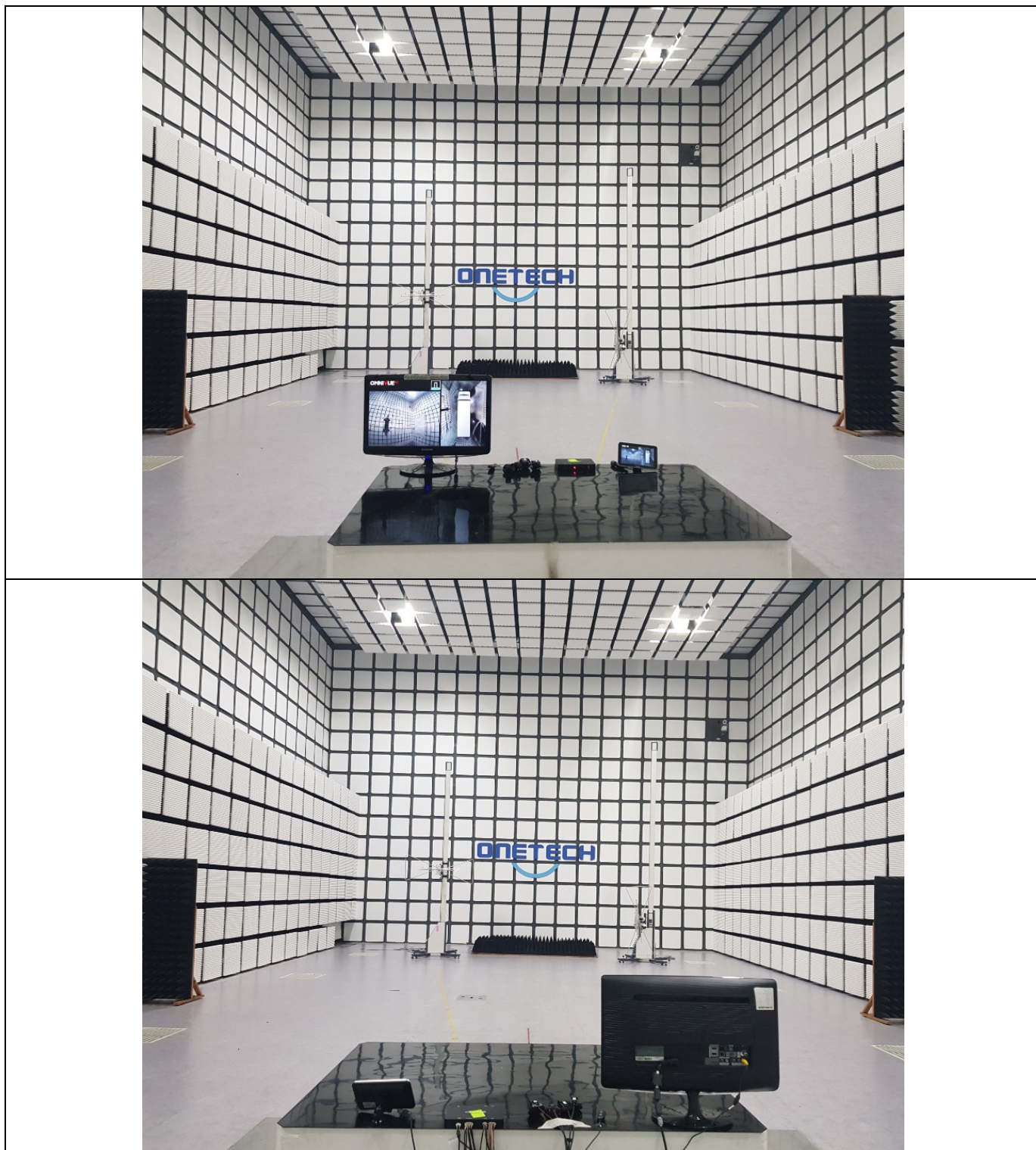
+	Meter reading	(dB μ V)
+	Cable Loss	(dB)
+	Antenna Factor	(dB/m)
=	Corrected Reading	(dB μ V/m)
Margin (dB)		
	Specification Limit	(dB μ V/m)
-	Corrected Reading	(dB μ V/m)
=	dB Relative to Spec	($\pm$ dB)

8. LIST OF TEST EQUIPMENT

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R & S	ESCI	101012	Oct. 22, 2018	One Year	■
2.			ESCI	101013	Mar. 28, 2018	One Year	□
3.			ESR	101470	Oct. 22, 2018	One Year	■
4.	Amplifier	Sonoma	310N	312544	Mar. 28, 2018	One Year	■
5.		Instrument	310N	312545	Mar. 28, 2018	One Year	■
6.		Hewlett Packard	8447D	2944A07777	Mar. 29, 2018	One Year	□
7.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-419	Aug. 14, 2018	Two Years	■
8.			VULB9163	9163-255	Jun. 05, 2018	Two Years	■
9.	Horn Antenna	Schwarzbeck	BBHA9120D	BBHA9120D295	Aug 16, 2017	Two Years	□
10.	Amplifier	Schwarzbeck	BBV9718	310	Mar. 30, 2018	One Year	□
11.	LISN	EMCO	3825/2	9109-1867	Mar. 28, 2018	One Year	□
12.				9109-1869	Apr. 11, 2018	One Year	□
13.		Schwarzbeck	NSLK 8128	8128-216	Mar. 28, 2018	One Year	■
14.			NSLK 8126	8126-404	Apr. 04, 2018	One Year	□
15.			NSLK 8126	8126-479	Oct. 24, 2017	One Year	□
16.	Pulse Limiter	Rohde & Schwarz	100655	ESH3Z2	Mar. 28, 2018	One Year	■
17.	Controller	Innco System	CO3000	CO3000/904 /37211215/L	N/A	N/A	■
18.			CO3000	N/A	N/A	N/A	□
19.	Turn Table	Innco System	DT3000	930611	N/A	N/A	■
20.			DT5000-3t-Teagplatten	N/A	N/A	N/A	□
21.	Antenna Master	Innco System	MA-4000XPET	MA4000/509 /37211215/L	N/A	N/A	■
22.			MA4000-EP	N/A	N/A	N/A	□

Remark: Mark ■ mean used equipment.

APPENDIX I - TEST SET-UP PHOTOS: (Radiated emission)



APPENDIX II - PHOTOGRAPHS REPORT







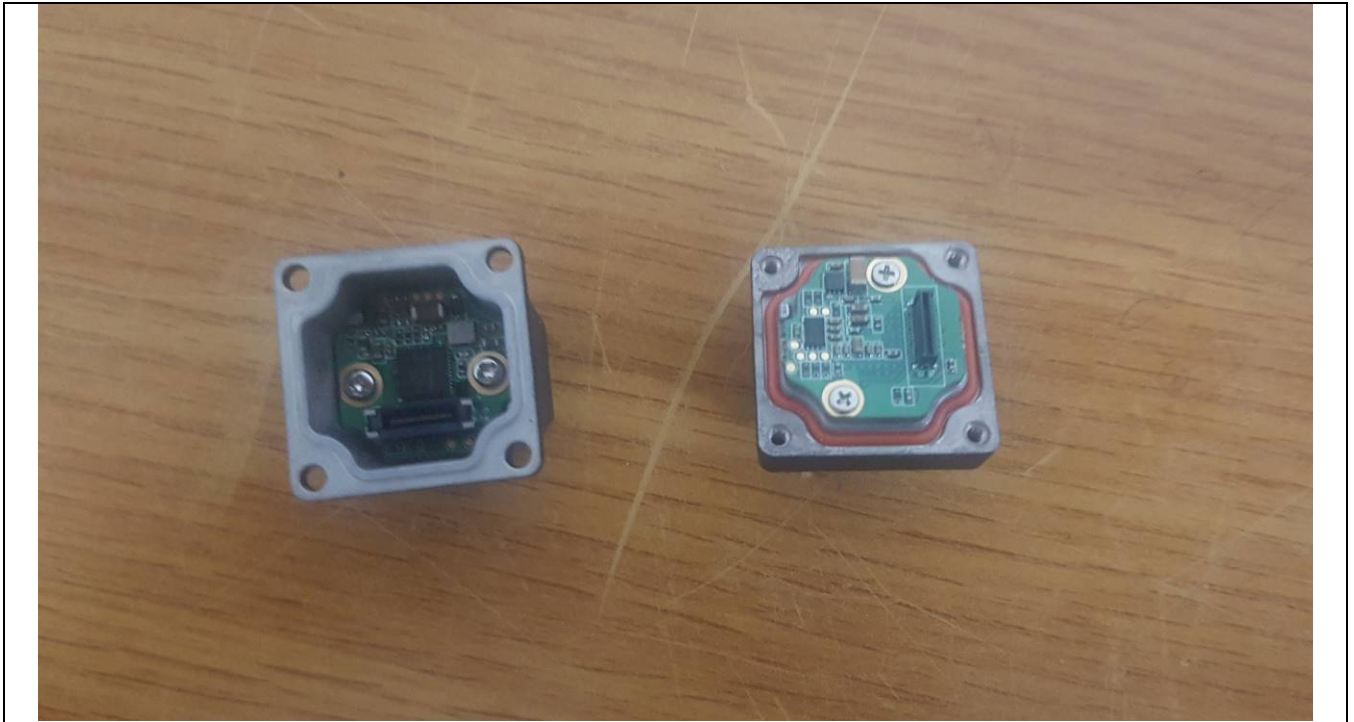
*** Remote Controller**





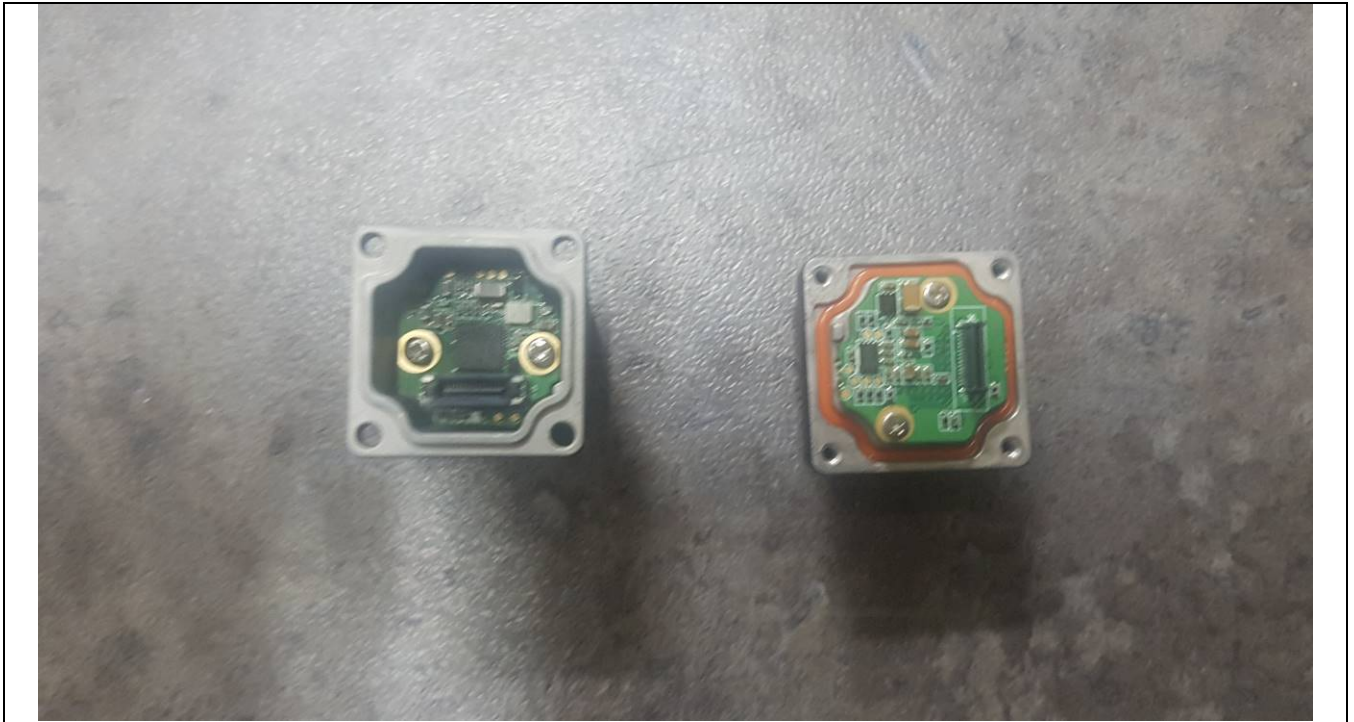
* Camera 1





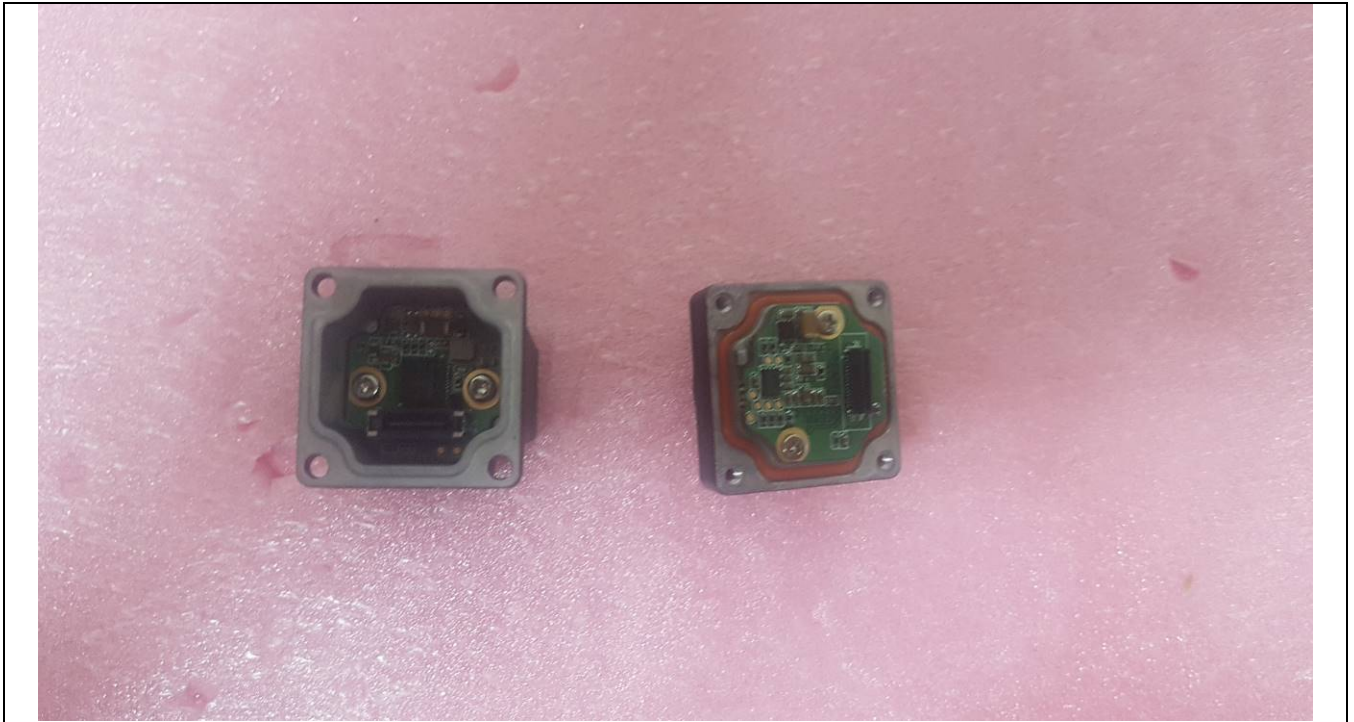
* Camera 2





* Camera 3





* Camera 4



