ELECTROMAGNETIC EMISSION COMPLIANCE REPORT

Test Report No. : **OT-207-RWD-019**

AGR No. : **A207A-009**

Applicant : **UNION COMMUNITY**

Address : **12F, Munjeong Daemyeong Valeon bldg, 127 Beobwon-ro Songpa-gu, Seoul, South Korea**

Manufacturer : **UNION COMMUNITY**

Address : **12F, Munjeong Daemyeong Valeon bldg, 127 Beobwon-ro Songpa-gu, Seoul, South Korea**

Type of Equipment : **Access controller**

FCC ID : **XX2-UBIO-XIRIS**

Model Name : **UBio-X Iris**

Multiple Model Name : **N/A**

Serial number : **N/A**

Total page of Report : **15 pages (including this page)**

Date of Incoming : **July 08, 2020**

Date of Issuing : **July 17, 2020**

SUMMARY

The equipment complies with the requirements of ***FCC CFR 47 PART 15 Subpart C Section 15.209 and 15.207.***

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

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

Reviewed by: Tae-Ho, Kim / Senior Manager, ONETECH Corp.

Approved by: Ki-Hong, Nam / General Manager, ONETECH Corp.

ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

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ONETECH Corp.: 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea (TEL: 82-31-799-9500, FAX: 82-31-799-9599)

Revision History

Rev. No.	Issue Report No.	Issued Date	Revisions	Section Affected
0	OT-207-RWD-019	July 17, 2020	Initial Release	All

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1. VERIFICATION OF COMPLIANCE

-. APPLICANT : UNION COMMUNITY

-. ADDRESS : 12F, Munjeong Daemyeong Valeon bldg, 127 Beobwon-ro Songpa-gu, Seoul, South Korea

-. CONTACT PERSON : Dong Ho, Lee

-. TELEPHONE NO : +82-2-6488-3054

-. FCC ID : XX2-UBIO-XIRIS

-. MODEL NO/NAME : UBio-X Iris

-. SERIAL NUMBER : N/A

-. DATE : July 17, 2020

DEVICE TYPE	DCD – Part 15, Low Power Transmitter below 1 705 kHz
E.U.T. DESCRIPTION	Access controller
THIS REPORT CONCERNS	Original Grant
MEASUREMENT PROCEDURES	ANSI C63.10: 2013
TYPE OF EQUIPMENT TESTED	Pre-Production
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC CFR47 Part 15 Subpart C Section 15.207 and 15.209
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	None
FINAL TEST WAS CONDUCTED ON	10 m, Semi Anechoic Chamber

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

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2. GENERAL INFORMATION

2.1 Product Description

The UNION COMMUNITY, Model UBio-X Iris (referred to as the EUT in this report) is an Access controller, Product specification information described herein was obtained from product data sheet or user's manual.

DEVICE TYPE	Access controller
TRANSMITTING FREQUENCY	125 kHz, 13.56 MHz, 2 402 MHz ~ 2 480 MHz
MODULATION	ASK
ANTENNA TYPE	Coil Antenna, PCB Antenna
LIST OF EACH OSC. or CRY. FREQ.(FREQ. >= 1 MHz)	124.19 kHz, 13.558 4 MHz, 27 MHz, 8MHz, 32.768 kHz, 7.3728 MHz, 27.12 MHz
USED AC/DC ADAPTER	Output : DC 15 V, 4 A Model No : KPL-060H-VI Manufacturer : Channel Well Technology(Guangzhou) Co.,Ltd.

2.2 Model Differences:

-. None.

2.3 Related Submittal(s) / Grant(s)

Original submittal only

2.4 Purpose of the test

To determine whether the equipment under test fulfills the requirements of the regulation stated in FCC PART 15 SUBPART C Section 15.209 and 15.207.

2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.10: 2013. Radiated testing was performed at a distance of 3 m from EUT to the antenna.

2.6 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 43-14, Jinsaegol-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-11842

ISED (Innovation, Science and Economic Development Canada) – Registration No. Site# 3736A-3

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

FCC (Federal Communications Commission) - Accreditation No. KR0013

RRA (Radio Research Agency) – Designation No. KR0013

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3. SYSTEM TEST CONFIGURATION

3.1 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	PAIrisMA01 V11	N/A
SUB BOARD	N/A	PAIrisRFMA01 V10	N/A
FINGERPRINT BOARD(1)	N/A	PFNSFMMA01 V10	N/A
FINGERPRINT BOARD(2)	N/A	PAirisDST01 V11	N/A
FINGERPRINT BOARD(3)	N/A	PAIrisTILT01 V10	N/A
CAMERA BOARD(1)	N/A	PAIrisFACM01 V10[SAU25]	N/A
CAMERA BOARD(2)	N/A	PAIrisIRCM01 V11	N/A
DISPLAY	N/A	CT5026N5006	N/A
SPEAKER(1)	N/A	N/A	N/A
SPEAKER(2)	N/A	N/A	N/A
Bluetooth LE Module	PROCHILD INC.	PBLN51822m	2AEEY-PBLN51822M
ADAPTER	Channel Well Technology (Guangzhow)Co., LTd.	KPL-060H-VI	N/A
13.56 MHz ANTENNA BOARD	N/A	PAIrisSC01 V10[SAU25]	N/A
125 kHz ANTENNA	N/A	N/A	N/A

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3.2 Peripheral equipment

Defined as equipment needed for correct operation of the EUT, but not considered as tested:

Model	Manufacturer	Description	Connected to
UBio-X Iris	UNION COMMUNITY	Access controller (EUT)	-
KPL-060H-VI	Channel Well Technology (Guangzhow)Co., LTd.	ADAPTER	EUT
Ideapad330	LENOVO	Notebook PC	EUT
N/A	N/A	Door Open Switch	EUT
N/A	N/A	Door lock	EUT
N/A	N/A	13.56 MHz Card	EUT
N/A	N/A	125 kHz Card	EUT

3.3 Mode of operation during the test

-. The EUT has 125 kHz RF boards for reading Card and program was used for making continuous transmission mode during the test.

3.4 Equipment Modifications

-. None

3.5 Configuration of Test System

Line Conducted Test : The EUT was connected to adaptor and the power of adaptor was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions.

Radiated Emission Test : Preliminary radiated emissions test were conducted using the procedure in ANSI C63.10: 2013 to determine the worse operating conditions. The radiated emissions measurements were performed on the 10 m Semi Anechoic Chamber.

For frequencies from 150 kHz to 30 MHz measurements were made of the magnetic H field. The measuring antenna is an electrically screened loop antenna.

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.

3.6 Antenna Requirement

For intentional device, according to section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Antenna Construction:

The transmitter antenna of the EUT is a Coil Antenna and PCB Antenna so there is no consideration of replacement by the user.

4. PRELIMINARY TEST

4.1 AC Power line Conducted Emissions Tests

During Preliminary Tests, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Transmitting Mode	X

4.2 Radiated Emissions Tests

During Preliminary Tests, the following operating modes were investigated

Operation Mode	The Worse operating condition (Please check one only)
Transmitting Mode	X

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5. FINAL RESULT OF 124.19 kHz MEASUREMENT

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

5.1 Conducted Emission Test

Humidity Level : (50 ~ 51) % R.H. Temperature: (22 ~ 23) ºC

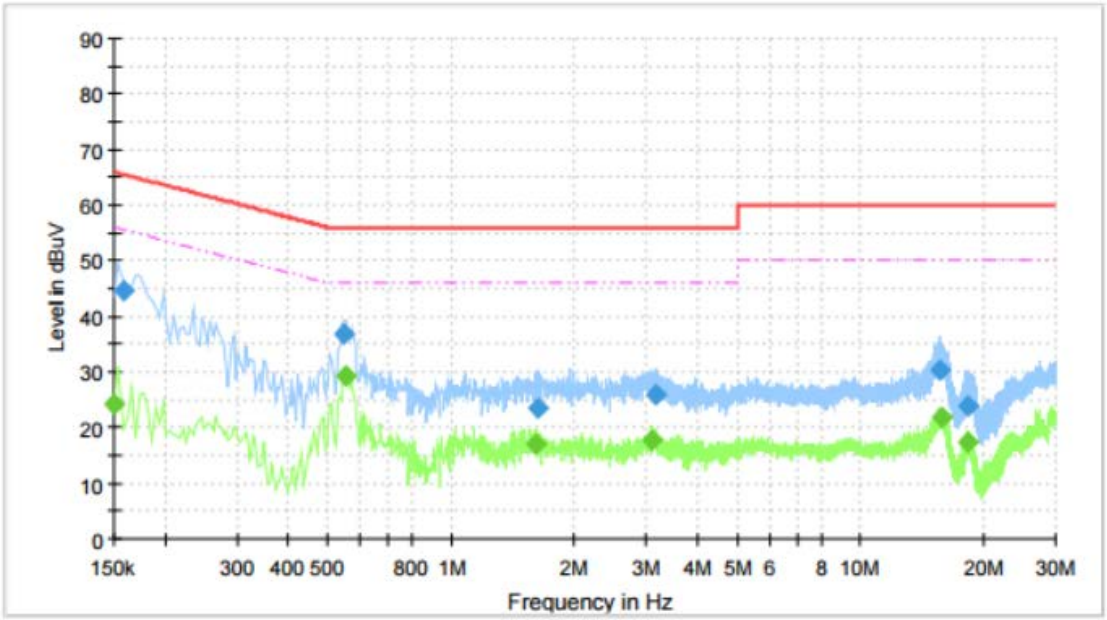
Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.207(a)

Result : PASSED

EUT : Access controller Date: July 08, 2020 ~ July 14, 2020

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Tested Line : HOT LINE



Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
1.626	23.68	---	56.00	32.32	3000.0	9.0	L1	10.00
18.326	23.84	---	60.00	36.16	3000.0	9.0	L1	10.56
3.162	25.76	---	56.00	30.24	3000.0	9.0	L1	10.04
15.636	30.36	---	60.00	29.64	3000.0	9.0	L1	10.48
0.546	36.98	---	56.00	19.02	3000.0	9.0	L1	9.93
0.159	44.55	---	65.54	21.00	3000.0	9.0	L1	9.93
18.262	---	17.26	50.00	32.74	3000.0	9.0	L1	10.56
15.827	---	21.70	50.00	28.30	3000.0	9.0	L1	10.49
1.606	---	16.88	46.00	29.12	3000.0	9.0	L1	10.00
0.554	---	29.42	46.00	16.58	3000.0	9.0	L1	9.93
3.102	---	17.75	46.00	28.25	3000.0	9.0	L1	10.04
0.150	---	24.15	56.00	31.85	3000.0	9.0	L1	9.94

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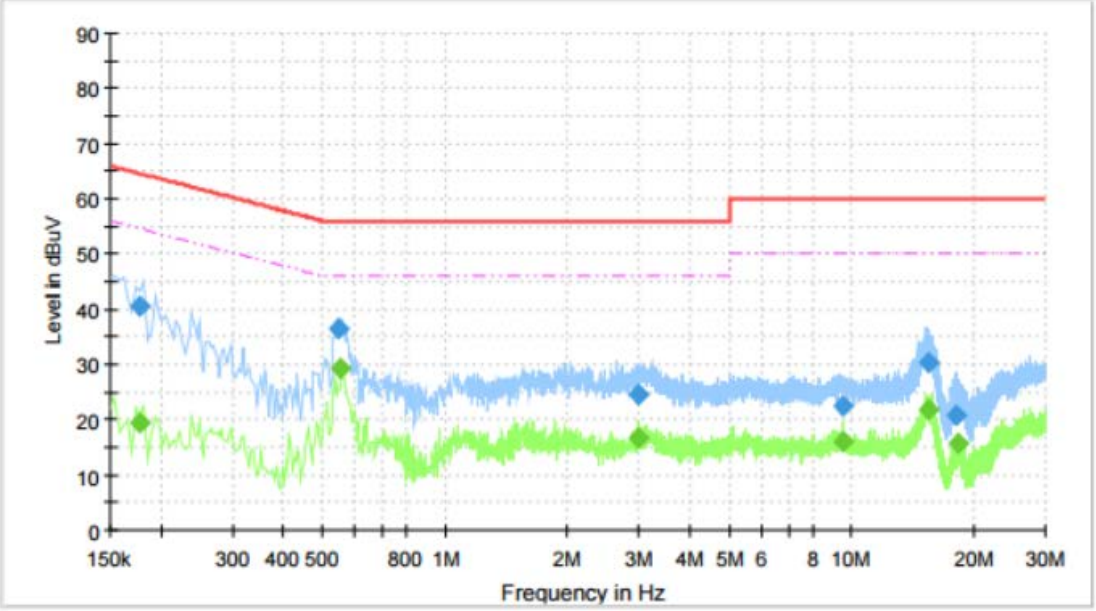
Tested Line : NEUTRAL LINE



Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.178	---	19.60	54.60	35.01	3000.0	9.0	N1	9.92
0.178	40.61	---	64.60	23.99	3000.0	9.0	N1	9.92
0.546	36.50	---	56.00	19.50	3000.0	9.0	N1	9.93
0.553	---	29.34	46.00	16.66	3000.0	9.0	N1	9.93
2.983	---	16.69	46.00	29.31	3000.0	9.0	N1	10.04
2.999	24.40	---	56.00	31.60	3000.0	9.0	N1	10.04
9.470	---	16.13	50.00	33.87	3000.0	9.0	N1	10.30
9.530	22.64	---	60.00	37.36	3000.0	9.0	N1	10.30
15.484	30.41	---	60.00	29.59	3000.0	9.0	N1	10.48
15.516	---	21.83	50.00	28.17	3000.0	9.0	N1	10.48
18.100	20.82	---	60.00	39.18	3000.0	9.0	N1	10.55
18.266	---	15.85	50.00	34.15	3000.0	9.0	N1	10.56

Remark: Margin (dB) = Limit – Level (Result)

The emission level in above table is included the transducer factor that means insertion loss (LISN), cable loss and attenuator.

Tested by: Soon-Ki, Choi / Engineer

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5.2 Radiated Emission Test below 30 MHz

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

Humidity Level : 48 % R.H. Temperature: 22 ˚C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.209

Type of Test : Low Power Transmitter below 1 705 kHz

Result : PASSED

EUT : Access controller Date: July 08, 2020 ~ July 14, 2020

Distance : 3 m

Frequency (MHz)	Reading (dBµV)	Ant. Pol. (H/V)	Ant. Height (m)	Angle (°)	Ant. Factor (dB/m)	Cable Loss	Emission Level(dBµV/m)	Limits (dBµV/m)	Margin (dB)
0.015	36.23	H	1	90	18.6	0.1	54.93	116.2	61.27
0.032	32.15	H	1	360	18.6	0.1	50.85	112.2	61.35
0.124 19	45.96	H	1	180	18.9	0.1	64.96	126	61.04
0.250	27.89	H	1	90	18.9	0.1	46.89	107.9	61.01
0.723	21.52	H	1	180	18.8	0.1	40.42	61.5	21.08
0.833	21.23	H	1	180	18.8	0.1	40.13	61.2	21.07

Radiated Emission Tabulated Data below 30 MHz

Note: According to the distance of measurements was reduced to 3 m, the limit was extrapolated by using the square of an inverse linear distance extrapolation factor (40 dB/decade) as follows.

Limit calculation: Limit at specified distance + 40log (300/3) = Limit + 80 dB for up to 0.49 MHz

Limit at specified distance + 40log (30/3) = Limit + 40 dB for above 0.49 MHz

Tested by: Soon-Ki, Choi / Engineer

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5.3 Radiated Emission Test above 30 MHz

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

Humidity Level : (50 ~ 51) % R.H. Temperature: (22 ~ 23) ºC

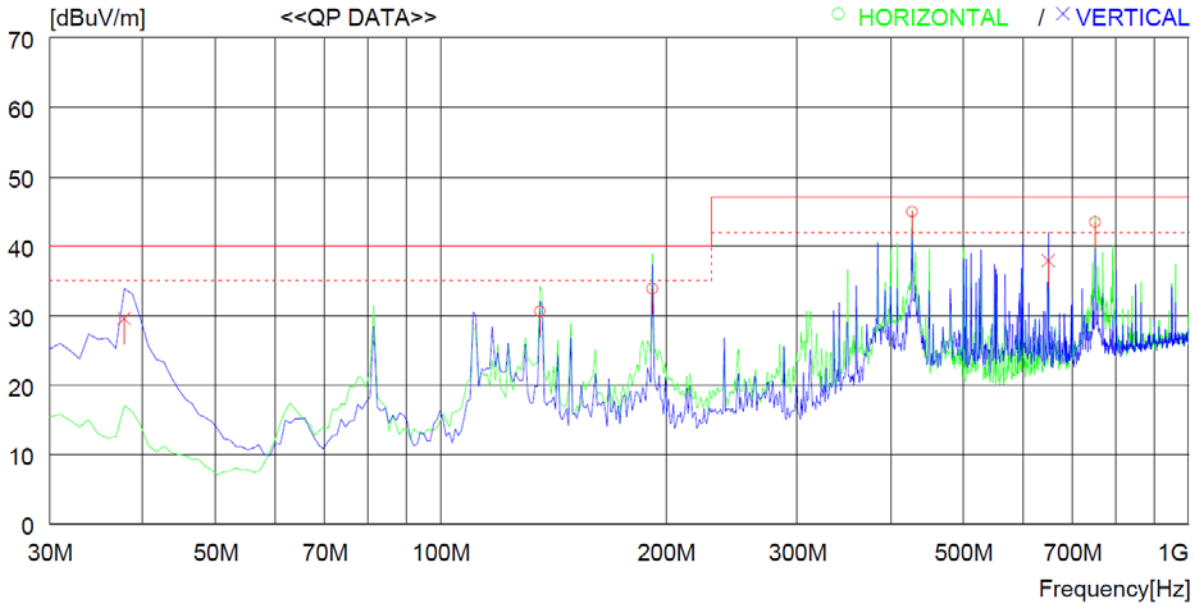
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.209

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

Type of Test : Low Power Transmitter below 1 705 kHz

EUT : Access controller Date: July 08, 2020 ~ July 14, 2020

Distance : 3 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	426.731	54.0	21.3	2.4	32.8	44.9	47.0	2.1	100	163
2	750.703	46.0	26.4	3.7	32.7	43.4	47.0	3.6	200	0
3	135.730	42.6	19.3	1.4	32.7	30.6	40.0	9.4	300	359
4	191.990	48.8	16.0	1.7	32.6	33.9	40.0	6.1	200	239
----- Vertical ------										
5	649.826	42.8	24.9	3.2	33.0	37.9	47.0	9.1	100	220
6	37.760	43.3	18.1	0.9	32.7	29.6	40.0	10.4	100	112

Tested by: Soon-Ki, Choi / Engineer

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5.4 Bandwidth of the operating frequency

Humidity Level : 48 % R.H. Temperature: 22 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.209

Type of Test : Low Power Transmitter below 1 705 kHz

EUT : Access controller Date: July 08, 2020 ~ July 14, 2020

Resolution Bandwidth : 0.3 kHz

Video Bandwidth : 1.0 kHz

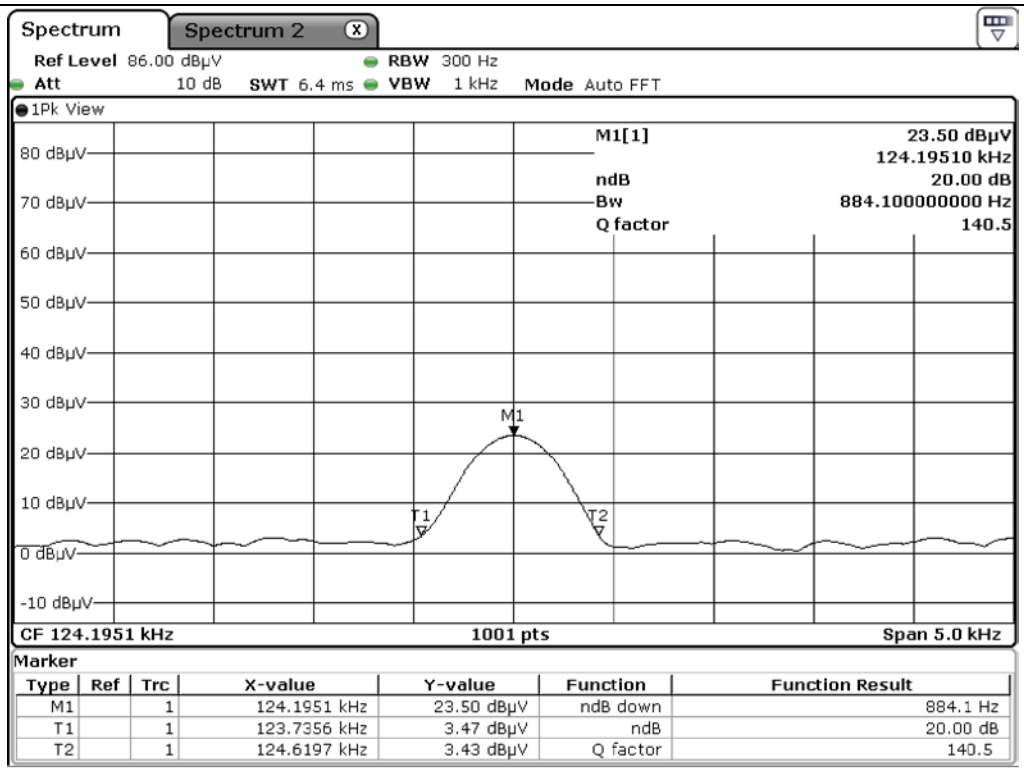
SPAN : 5.00 kHz

Carrier Freq. (kHz)	Bandwidth of the emission. (kHz)	Limit (kHz)	Remark
124.19	0.884 1	None	The point 20 dB down from the modulated carrier

Remark: Please refer to Photo Data for bandwidth for test data.

Tested by: Soon-Ki, Choi / Engineer

Photo Data for bandwidth



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6. FIELD STRENGTH CALCULATION

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

+	Meter reading	(dBμV)
-	Amplifier Gain	(dB)
+	Cable Loss	(dB)
-	Antenna Factor	(dB/m)
=	Corrected Result	(dBμV/m)

Margin (dB)

	Specification Limit	(dBuV/m)
-	Corrected Result	(dBuV/m)
=	dB Relative to Spec	(± dB)

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7. LIST OF TEST EQUIPMENT

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESCI	101012	Oct. 22, 2019	One Year	-
2.		R/S	ESR	101470	Oct. 22, 2019	One Year	■
3.		R/S	ESCI	101012	Oct. 22, 2019	One Year	■
4.	Spectrum analyzer	R/S	FSV30	101372	Jul. 24, 2019	One Year	■
5.	Amplifier	Sonoma Instrument	310N	312544	Mar. 16, 2020	One Year	■
6.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-255	Sep. 24, 2019	Two Year	■
7.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-419	Mar. 20, 2020	Two Year	-
8.	Controller	Innco System	CO3000	CO3000/904/ 37211215/L	N/A	N/A	■
9.	LISN	EMCO	3825/2	9109-1869	Mar. 16, 2020	One Year	-
		Schwarzbeck	NNLK8121	804	Oct. 21, 2019	One Year	■
		Schwarzbeck	NSLK8128	8128-216	Mar. 16, 2020	One Year	■
10.	Turn Table	Innco System	DT3000	930611	N/A	N/A	■
11.	Antenna Master	Innco System	MA4000-EP	MA4000/332	N/A	N/A	-
12.	Antenna Master	Innco System	MA-4000XPET	MA4000/509	N/A	N/A	■
13.	Loop Antenna	Schwarzbeck	FMZB 1513	1513-235	Mar. 24, 2020	Two Year	■
14.	Frequency Counter	HP	53152A	US39270295	Jul. 25, 2019	One Year	■
15.	Environmental Test Chamber	ESPEC	PSL-2KP	14009407	Feb. 21, 2020	One Year	■
16.	Controller	Innco System	CO3000	1026/40960617/P	N/A	N/A	■
17.	Turn Table	Innco System	DT2000-2t	N/A	N/A	N/A	■
18.	Antenna Master	Innco System	MA-4640-XPET	N/A	N/A	N/A	■
19.	Hybrid Antenna	TDK RF Solutions	HLP-2008	131316	Mar.25, 2020	One Year	■
20.	Amplifier	Sonoma Instrument	310N	392756	Oct.16, 2019	One Year	■
21.	DC Power Supply	Protek	PWS-3003D	4020409	Jul. 24, 2019	One Year	■

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