

# ELECTROMAGNETIC EMISSION COMPLIANCE REPORT

**Test Report No.** : OT-195-RWD-022

**AGR No.** : A194A-150R

**Applicant** : UNION COMMUNITY

**Address** : Hyundai Topics Bldg. Bangi 2-dong, Songpa-gu, Seoul, South Korea

**Manufacturer** : UNION COMMUNITY

**Address** : Hyundai Topics Bldg. Bangi 2-dong, Songpa-gu, Seoul, South Korea

**Type of Equipment** : Access controller

**FCC ID** : XX2-UBIO-XSLIM-SC

**Model Name** : UBio-X Slim SC

**Multiple Model Name** : N/A

**Serial number** : N/A

**Total page of Report** : 21 pages (including this page)

**Date of Incoming** : April 29, 2019

**Date of Issuing** : May 21, 2019

## SUMMARY

The equipment complies with the requirements of *FCC CFR 47 PART 15 SUBPART C Section 15.225*

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

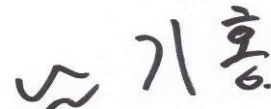
It is not a general valid assessment of the features of the respective products of the mass-production.

Reviewed by:



Tae-Ho, Kim / Senior Manager  
ONETECH Corp.

Approved by:



Ki-Hong, Nam / Chief Engineer  
ONETECH Corp.

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**Revision History**

| Rev. No. | Issue Report No. | Issued Date  | Revisions       | Section Affected |
|----------|------------------|--------------|-----------------|------------------|
| 0        | OT-195-RWD-022   | May 21, 2019 | Initial Release | All              |
|          |                  |              |                 |                  |
|          |                  |              |                 |                  |

## 1. VERIFICATION OF COMPLIANCE

- . APPLICANT : UNION COMMUNITY
- . ADDRESS : Hyundai Topics Bldg. Bangi 2-dong, Songpa-gu, Seoul, South Korea
- . CONTACT PERSON : KyungWook, Han
- . TELEPHONE NO : +82-2-6488-3027
- . FCC ID : XX2-UBIO-XSLIM-SC
- . MODEL NO/NAME : UBio-X Slim SC
- . SERIAL NUMBER : N/A
- . DATE : May 21, 2019

|  |  |
|--|--|
| DEVICE TYPE  | DXX – Low Power Communication Device Transmitter |
| 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 15.225       |
| MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE | None   |
| FINAL TEST WAS CONDUCTED ON                          | 3 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.

## 2. TEST SUMMARY

### 2.1 Test items and results

| SECTION            | TEST ITEMS   | RESULTS                |
|--------------------|--|------------------------|
| 15.215 (c)         | 20 dB BANDWIDTH  | Met the Limit / PASS   |
| 15.225 (e)         | FREQUENCY STABILITY WITH TEMPERATURE VARIATION /<br>FREQUENCY STABILITY WITH VOLTAGE VARIATION | Met the Limit / PASS   |
| 15.225 (a),(b),(c) | Radiated Emission Limits   | Met the Limit / PASS   |
| 15.209, 15.225(e)  | SPURIOUS EMISSION TEST   | Met the Limit / PASS   |
| 15.207             | Conducted Limits   | Met the Limit / PASS   |
| 15.203             | Antenna Requirement  | Met requirement / PASS |

### 2.2 Related Submittal(s) / Grant(s)

Original submittal only

### 2.3 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 15.225.

### 2.4 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.

### 2.5 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-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

### 3. GENERAL INFORMATION

#### 3.1 Product Description

The UNION COMMUNITY, Model UBio-X Slim SC (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                           | 13.56 MHz , 2 402 MHz ~ 2 480 MHz   |
| MODULATION                                       | ASK   |
| ANTENNA TYPE                                     | PCB Antenna   |
| LIST OF EACH OSC.<br>OR CRY. FREQ.(FREQ.>= 1MHz) | 32.768 kHz, 24 MHz, 25 MHz, 7.327 28 MHz, 13.560 9 MHz, 27.12 MHz   |
| USED AC/DC ADAPTER                               | OUTPUT: DC 12 V, 3.5 A<br>Model No : DSA-42PFB-12 1 120350<br>Manufacturer : Dee Van Electronics(Longchuan)Co., Ltd |

#### 3.2 Model Differences:

-. None

## 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                                    | PFXSMA01 V1.0 RSE20   | N/A              |
| FINGERPRINT BOARD   | N/A                                    | PFNSSESMA01 V10 RJL16 | N/A              |
| SAM BOARD           | N/A                                    | PF2200SC01 V11 QFE20  | N/A              |
| ANTENNA BOARD       | N/A                                    | PFXSSA01 V1.0 RSE20   | N/A              |
| LCD                 | KJC Display Corp                       | 10354-181102-00002    | N/A              |
| CAMERA MODULE       | N/A                                    | N/A                   | N/A              |
| Bluetooth LE Module | PROCHILD INC.                          | PBLN51822m            | 2AEEY-PBLN51822M |
| ADAPTER             | Dee Van Electronics(Longchuan)Co., Ltd | DSA-42PFB-12 1 120350 | N/A              |

### 4.2 Peripheral equipment

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

| Model                 | Manufacturer                           | Description             | Connected to |
|-----------------------|--|-------------------------|--------------|
| UBio-X Slim SC        | UNION COMMUNITY                        | Access controller (EUT) | -            |
| DSA-42PFB-12 1 120350 | Dee Van Electronics(Longchuan)Co., Ltd | ADAPTER                 | EUT          |
| N/A                   | N/A                                    | Door Open Switch        | EUT          |
| N/A                   | N/A                                    | Door lock               | EUT          |
| N/A                   | N/A                                    | RFID Card               | EUT          |

### 4.3 Mode of operation during the test

-. The EUT has 13.56 MHz RF boards for reading Card and program was used for making continuous transmission mode during the test.

### 4.4 Equipment Modifications

-. None



#### 4.5 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.

#### 4.6 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 PCB Antenna so there is no consideration of replacement by the user.

### 5. PRELIMINARY TEST

#### 5.1 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   |

#### 5.2 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   |

## 6. FINAL RESULT OF MEASUREMENT

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

### 6.1 Conducted Emission Test

#### 6.1.1 Test data for RFID Transmitting Mode

Humidity Level : (46 ~ 47) % R.H. Temperature: (23 ~ 24) °C

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

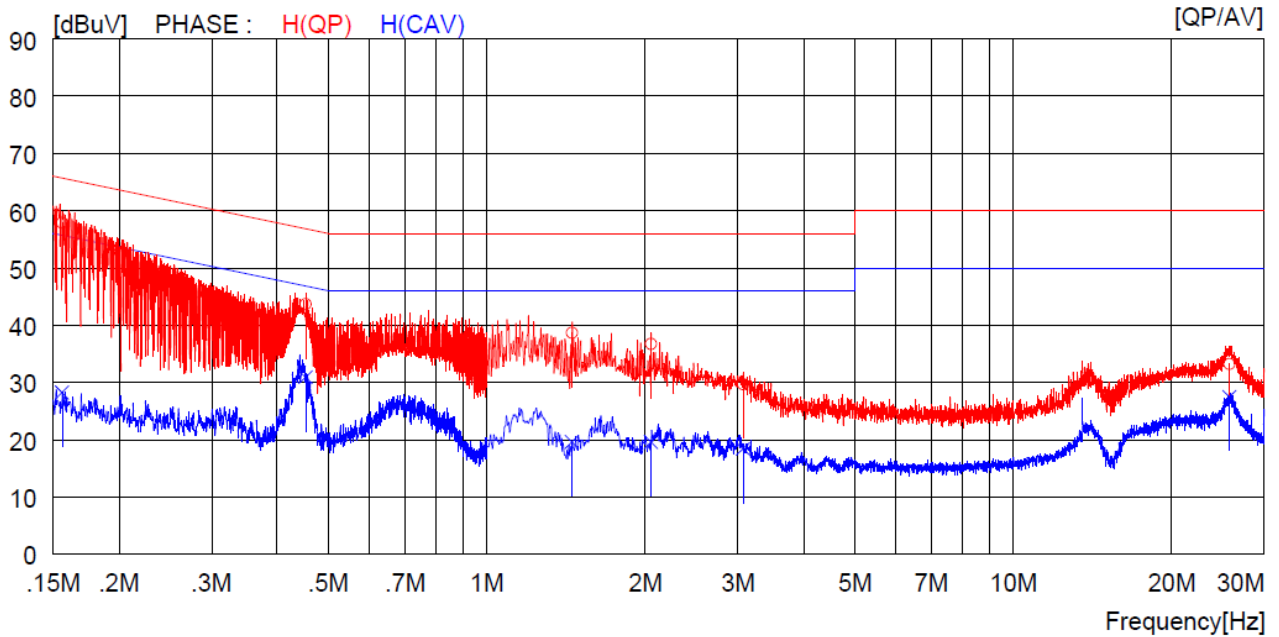
Result : PASSED

EUT : Access controller

Date: May 01, 201

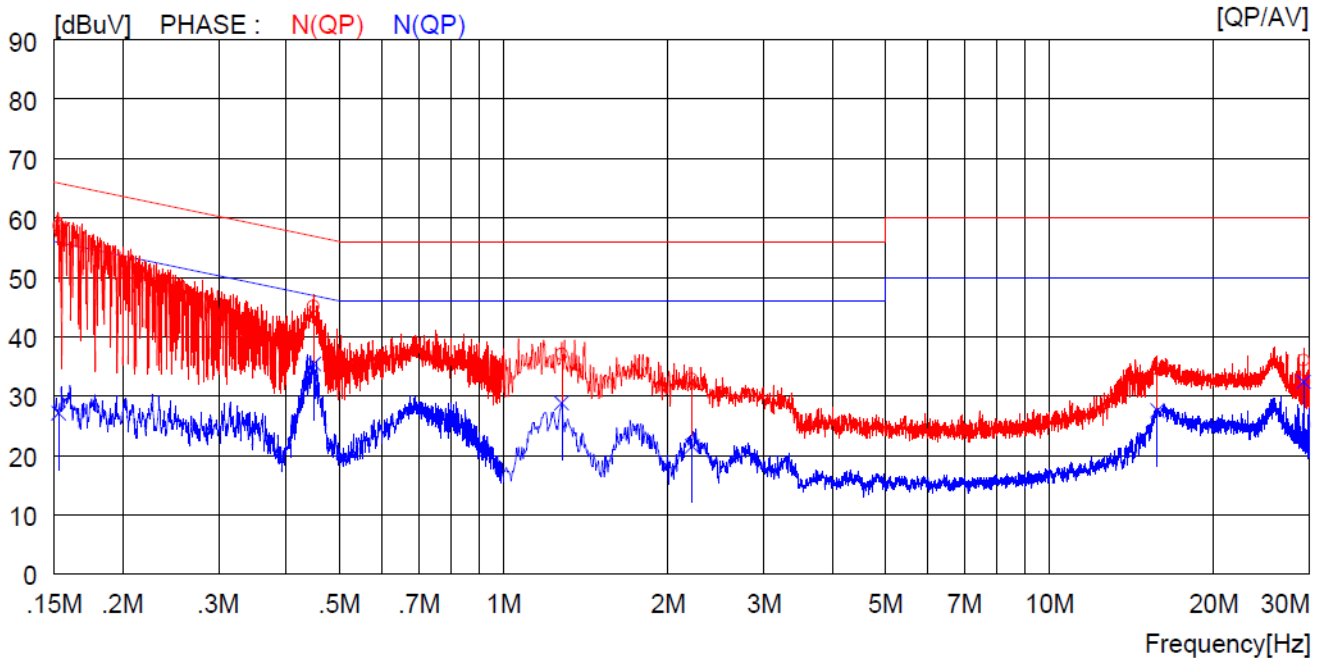
Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Tested Line : HOT LINE



| NO | FREQ<br>[MHz] | READING      |              | C. FACTOR<br>[dB] | RESULT       |              | LIMIT        |              | MARGIN       |              | PHASE   |
|----|---------------|--------------|--------------|-------------------|--------------|--------------|--------------|--------------|--------------|--------------|---------|
|    |               | QP<br>[dBuV] | AV<br>[dBuV] |                   | QP<br>[dBuV] | AV<br>[dBuV] | QP<br>[dBuV] | AV<br>[dBuV] | QP<br>[dBuV] | AV<br>[dBuV] |         |
| 1  | 0.15600       | 47.9         | ----         | 10.0              | 57.9         | ----         | 65.7         | ----         | 7.8          | ----         | H (QP)  |
| 2  | 0.45300       | 33.6         | ----         | 10.0              | 43.6         | ----         | 56.8         | ----         | 13.2         | ----         | H (QP)  |
| 3  | 1.45200       | 28.5         | ----         | 10.1              | 38.6         | ----         | 56.0         | ----         | 17.4         | ----         | H (QP)  |
| 4  | 2.05200       | 26.6         | ----         | 10.1              | 36.7         | ----         | 56.0         | ----         | 19.3         | ----         | H (QP)  |
| 5  | 3.06800       | 19.6         | ----         | 10.1              | 29.7         | ----         | 56.0         | ----         | 26.3         | ----         | H (QP)  |
| 6  | 25.78000      | 22.8         | ----         | 10.4              | 33.2         | ----         | 60.0         | ----         | 26.8         | ----         | H (QP)  |
| 7  | 0.15600       | ----         | 18.2         | 10.0              | ----         | 28.2         | ----         | 55.7         | ----         | 27.5         | H (CAV) |
| 8  | 0.45300       | ----         | 20.9         | 10.0              | ----         | 30.9         | ----         | 46.8         | ----         | 15.9         | H (CAV) |
| 9  | 1.45200       | ----         | 9.5          | 10.1              | ----         | 19.6         | ----         | 46.0         | ----         | 26.4         | H (CAV) |
| 10 | 2.05200       | ----         | 9.5          | 10.1              | ----         | 19.6         | ----         | 46.0         | ----         | 26.4         | H (CAV) |
| 11 | 3.06800       | ----         | 8.3          | 10.1              | ----         | 18.4         | ----         | 46.0         | ----         | 27.6         | H (CAV) |
| 12 | 25.78000      | ----         | 17.1         | 10.4              | ----         | 27.5         | ----         | 50.0         | ----         | 22.5         | H (CAV) |

Tested Line : NEUTRAL LINE



| NO | FREQ<br>[MHz] | READING      |              | C. FACTOR<br>[dB] | RESULT       |              | LIMIT        |              | MARGIN       |              | PHASE   |
|----|---------------|--------------|--------------|-------------------|--------------|--------------|--------------|--------------|--------------|--------------|---------|
|    |               | QP<br>[dBuV] | AV<br>[dBuV] |                   | QP<br>[dBuV] | AV<br>[dBuV] | QP<br>[dBuV] | AV<br>[dBuV] | QP<br>[dBuV] | AV<br>[dBuV] |         |
| 1  | 0.15300       | 48.7         | ----         | 10.0              | 58.7         | ----         | 65.8         | ----         | 7.1          | ----         | N (QP)  |
| 2  | 0.44800       | 35.0         | ----         | 10.1              | 45.1         | ----         | 56.9         | ----         | 11.8         | ----         | N (QP)  |
| 3  | 1.27600       | 27.0         | ----         | 10.1              | 37.1         | ----         | 56.0         | ----         | 18.9         | ----         | N (QP)  |
| 4  | 2.21200       | 22.8         | ----         | 10.1              | 32.9         | ----         | 56.0         | ----         | 23.1         | ----         | N (QP)  |
| 5  | 15.78000      | 24.3         | ----         | 10.3              | 34.6         | ----         | 60.0         | ----         | 25.4         | ----         | N (QP)  |
| 6  | 29.24000      | 25.5         | ----         | 10.5              | 36.0         | ----         | 60.0         | ----         | 24.0         | ----         | N (QP)  |
| 7  | 0.15300       | ----         | 17.1         | 10.0              | ----         | 27.1         | ----         | 55.8         | ----         | 28.7         | N (CAV) |
| 8  | 0.44800       | ----         | 25.3         | 10.1              | ----         | 35.4         | ----         | 46.9         | ----         | 11.5         | N (CAV) |
| 9  | 1.27600       | ----         | 18.7         | 10.1              | ----         | 28.8         | ----         | 46.0         | ----         | 17.2         | N (CAV) |
| 10 | 2.21200       | ----         | 11.4         | 10.1              | ----         | 21.5         | ----         | 46.0         | ----         | 24.5         | N (CAV) |
| 11 | 15.78000      | ----         | 17.3         | 10.3              | ----         | 27.6         | ----         | 50.0         | ----         | 22.4         | N (CAV) |
| 12 | 29.24000      | ----         | 21.9         | 10.5              | ----         | 32.4         | ----         | 50.0         | ----         | 17.6         | N (CAV) |

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: Ju Yun Park / Assistant Manager

## 6.2 RADIATED EMISSION TEST

### 6.2.1 Operation frequency band: (13.553 ~ 13.567) MHz

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

Humidity Level : 46 % R.H. Temperature: 23 °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: April 29, 2019 ~ May 07, 2019  
 Operating Condition : Transmitting Mode  
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)  
 Distance : 3 m

| Radiated Emission |                 | Ant  | Correction Factors |            | Total              | FCC            |             |
|-------------------|-----------------|------|--------------------|------------|--------------------|----------------|-------------|
| Freq. (MHz)       | Amplitud (dBμV) | Pol. | Antenna (dB/m)     | Cable (dB) | Amplitude (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
| 13.560 9          | 27.80           | H    | 20.37              | 0.3        | 48.47              | 124            | 75.53       |
| 13.560 9          | 24.00           | V    | 20.37              | 0.3        | 44.67              | 124            | 79.33       |

Remark. The EUT was tested at 3 m, so conversation factor was included at above limit.



**Tested by: Ju Yun Park / Assistant Manager**




### 6.3 SPURIOUS EMISSION TEST

#### 6.3.1 Spurious Radiated Emission Below 30 MHz

Humidity Level : 46 % R.H. Temperature: 23 °C  
 Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.209  
 Type of Test : Low Power Transmitter below 1 705 kHz  
 Frequency Range : 9 kHz ~ 30 MHz  
 Result : PASSED

EUT : Access controller Date: April 29, 2019 ~ May 07, 2019  
 Operating Condition : Transmitting Mode  
 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) |
|---|----------------|-----------------|-----------------|-----------|--------------------|------------|------------------------|-----------------|-------------|
| It was not observed any emissions from the EUT. |                |                 |                 |           |                    |            |                        |                 |             |


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**Tested by: Ju Yun Park / Assistant Manager**

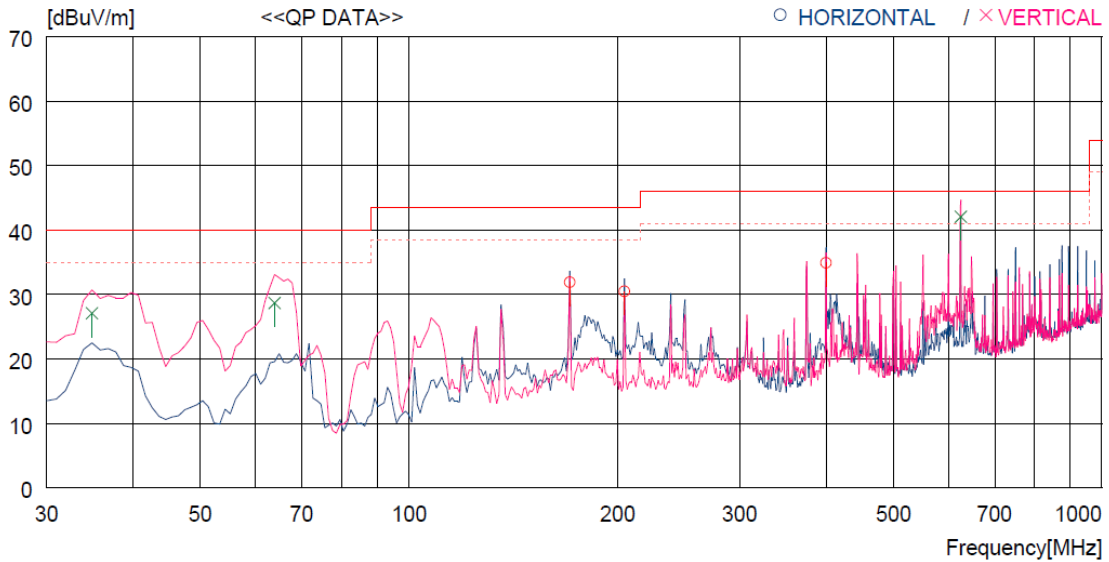
**6.3.2 Spurious Radiated Emission below 1 GHz**

**6.3.2.1 Test data for RFID Transmitting Mode**

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

Humidity Level : (49 ~ 50) % R.H. Temperature: (22 ~ 23) °C  
 Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.209  
 Type of Test : Low Power Transmitter below 1 705 kHz  
 Frequency range : 30 MHz ~ 1 000 MHz  
 Result : PASSED

EUT : Access controller Date: April 29, 2019 ~ May 07, 2019  
 Operating Condition : Transmitting Mode  
 Distance : 3 m



| No.                    | FREQ<br>[MHz] | READING<br>QP<br>[dBuV] | ANT<br>FACTOR<br>[dB] | LOSS<br>[dB] | GAIN<br>[dB] | RESULT<br>[dBuV/m] | LIMIT<br>[dBuV/m] | MARGIN<br>[dB] | ANTENNA<br>[cm] | TABLE<br>[DEG] |
|------------------------|---------------|-------------------------|-----------------------|--------------|--------------|--------------------|-------------------|----------------|-----------------|----------------|
| ----- Horizontal ----- |               |                         |                       |              |              |                    |                   |                |                 |                |
| 1                      | 170.650       | 52.8                    | 9.1                   | 3.0          | 33.0         | 31.9               | 43.5              | 11.6           | 200             | 0              |
| 2                      | 204.600       | 49.3                    | 10.9                  | 3.3          | 33.0         | 30.5               | 43.5              | 13.0           | 100             | 359            |
| 3                      | 399.570       | 47.5                    | 15.9                  | 4.6          | 33.1         | 34.9               | 46.0              | 11.1           | 200             | 0              |
| ----- Vertical -----   |               |                         |                       |              |              |                    |                   |                |                 |                |
| 4                      | 34.850        | 45.5                    | 13.3                  | 1.4          | 33.1         | 27.1               | 40.0              | 12.9           | 100             | 0              |
| 5                      | 63.950        | 48.2                    | 11.7                  | 1.9          | 33.1         | 28.7               | 40.0              | 11.3           | 100             | 0              |
| 6                      | 625.577       | 50.1                    | 19.6                  | 5.7          | 33.3         | 42.1               | 46.0              | 3.9            | 100             | 0              |

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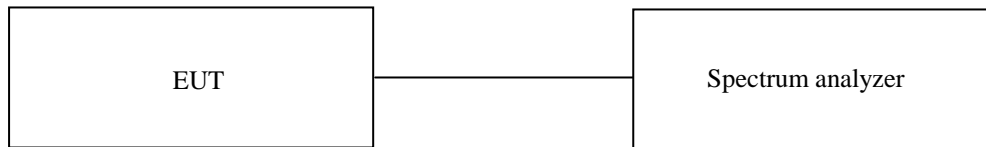
## 6.4 20 dB BANDWIDTH

### 6.4.1 Operating environment

Temperature : 23 °C  
Relative humidity : 46 % R.H.

### 6.4.2 Test set-up

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 10 kHz, and peak detection was used. The 20 dB bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 20 dB.



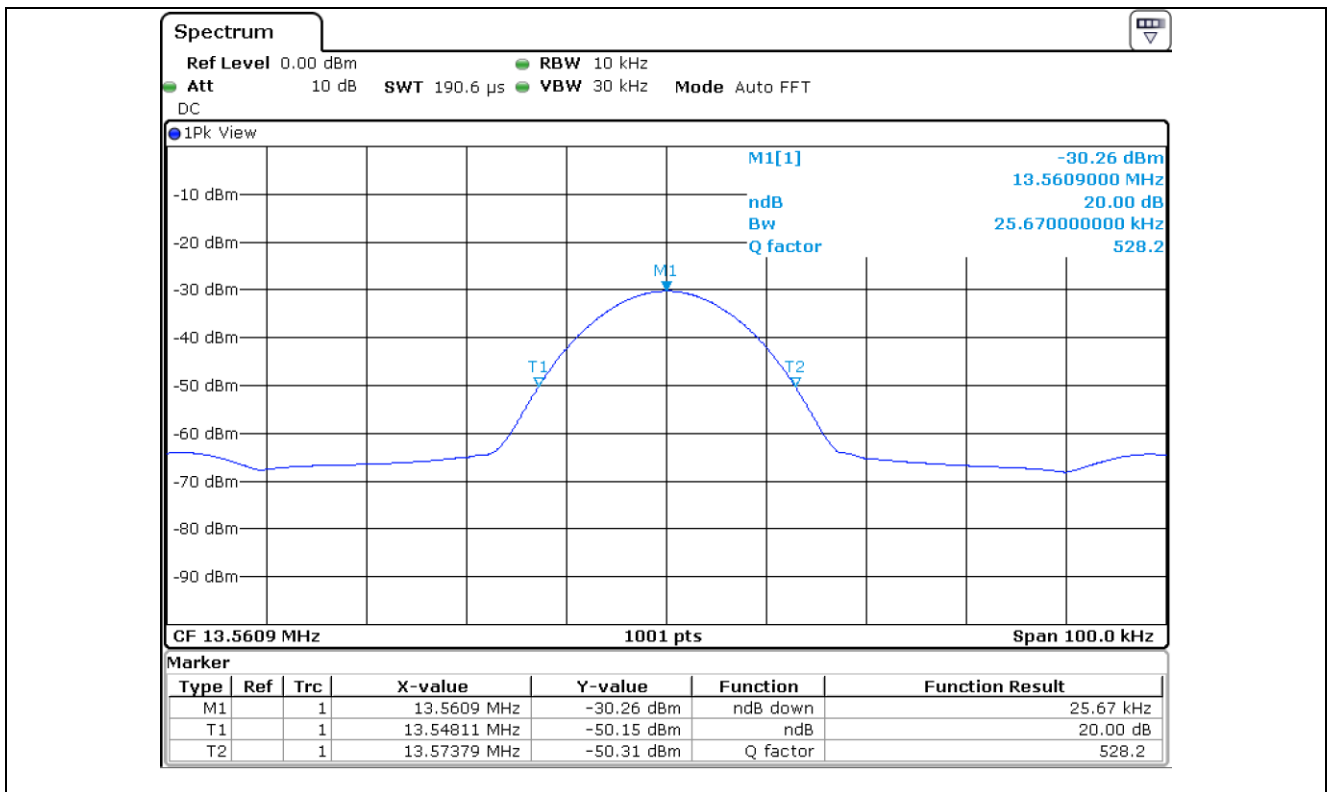


**6.4.3 Test data**

- Test Date : April 29, 2019 ~ May 07, 2019
- Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.209

| Operating Freq. (MHz) | Measured Value (kHz) | Assigned Operating Frequency Band (kHz) | Result      |
|-----------------------|----------------------|---|-------------|
| 13.560 9              | 25.67                | 900                                     | <b>PASS</b> |

**Tested by: Ju Yun Park / Assistant Manager**



## 6.5 FREQUENCY STABILITY WITH TEMPERATURE VARIATION

### 6.5.1 Operating environment

Temperature : 23 °C  
 Relative humidity : 46 % R.H.

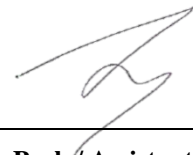
### 6.5.2 Test set-up

Turn EUT off and set chamber temperature to -20 °C and then allow sufficient time (approximately 20 to 30 minutes after chamber reach the assigned temperature) for EUT to stabilize. Turn ON EUT and measure the EUT operating frequency and then turn off the EUT after the measurement. The temperature in the chamber was raised 10 °C step from -20 °C to +50°C. Repeat above method for frequency measurements every 10 °C step and then record all measured frequencies on each temperature step.

### 6.5.3 Test data

-. Test Date : April 29, 2019 ~ May 07, 2019  
 -. Result : PASSED

| Temperature (°C) | Carrier Freq. (Hz) | Measured Freq. (Hz) | Margin (Hz) | Limit (Hz) |
|------------------|--------------------|---------------------|-------------|------------|
| -20              | 13,560,900         | 13,560,851          | -49         | ± 1 356.09 |
| -10              |                    | 13,560,853          | -47         |            |
| 0                |                    | 13,560,867          | -33         |            |
| 10               |                    | 13,560,864          | -36         |            |
| 20               |                    | 13,560,871          | -29         |            |
| 30               |                    | 13,560,873          | -27         |            |
| 40               |                    | 13,560,856          | -44         |            |
| 50               |                    | 13,560,852          | -48         |            |



Tested by: **Ju Yun Park** / Assistant Manager

## 6.6 FREQUENCY STABILITY WITH VOLTAGE VARIATION

### 6.6.1 Operating environment

Temperature : 23 °C  
 Relative humidity : 46 % R.H.

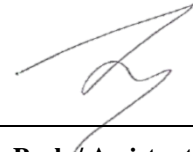
### 6.6.2 Test set-up

An external DC power supply was connected to the input of the EUT. The voltage of EUT set to 115 % of the nominal value and then was reduced to 85 % of nominal voltage. The output frequency was recorded at each step.

### 6.6.3 Test data

-. Test Date : April 29, 2019 ~ May 07, 2019  
 -. Result : PASSED

| Voltage (Vdc) | Carrier Freq. (Hz) | Measured Freq. (Hz) | Margin (Hz) | Limit (Hz) |
|---------------|--------------------|---------------------|-------------|------------|
| 13.80(115 %)  | 13,560,900         | 13,560,876          | -24         | ± 1 356.09 |
| 12.00(100 %)  |                    | 13,560,871          | -29         |            |
| 10.20(85 %)   |                    | 13,560,879          | -21         |            |



Tested by: **Ju Yun Park** / Assistant Manager

## 7. FIELD STRENGTH CALCULATION

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

|                    |                |
|--------------------|----------------|
| + Meter reading    | (dB $\mu$ V)   |
| - Amplifier Gain   | (dB)           |
| + Cable Loss       | (dB)           |
| - Antenna Factor   | (dB/m)         |
| <hr/>              |                |
| = Corrected Result | (dB $\mu$ V/m) |

Margin (dB)

|                       |             |
|-----------------------|-------------|
| Specification Limit   | (dBuV/m)    |
| - Corrected Result    | (dBuV/m)    |
| <hr/>                 |             |
| = 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.  |                            | R/S               | ESR         | 101470                    | Oct. 22, 2018 | One Year | ■   |
| 3.  |                            | R/S               | ESPI        | 101278                    | Oct. 20, 2018 | One Year | ■   |
| 4.  | Spectrum analyzer          | R/S               | FSV30       | 101372                    | Aug. 23, 2018 | One Year | ■   |
| 5.  | Amplifier                  | Sonoma Instrument | 310N        | 312544                    | Mar. 18, 2019 | One Year | ■   |
| 6.  | Amplifier                  | Sonoma Instrument | 310N        | 312545                    | Mar. 18, 2019 | One Year | -   |
| 7.  | TRILOG Broadband Antenna   | Schwarzbeck       | VULB9163    | 9163-255                  | Jun. 05, 2018 | Two Year | ■   |
| 8.  | TRILOG Broadband Antenna   | Schwarzbeck       | VULB9163    | 9163-419                  | Aug. 09, 2018 | Two Year | -   |
| 9.  | Controller                 | Innco System      | CO3000      | CO3000/904/<br>37211215/L | N/A           | N/A      | ■   |
| 10. | LISN                       | EMCO              | 3825/2      | 9109-1867                 | Mar. 27, 2019 | One Year | -   |
|     |                            |                   |             | 9109-1869                 | Mar. 19, 2019 | One Year | ■   |
|     |                            | Schwarzbeck       | NNLK8121    | 804                       | Oct. 22, 2018 | One Year | ■   |
|     |                            | Schwarzbeck       | NSLK8128    | 8128-216                  | Mar. 20, 2019 | One Year | ■   |
| 11. | Turn Table                 | Innco System      | DT3000      | 930611                    | N/A           | N/A      | ■   |
| 12. | Antenna Master             | Innco System      | MA4000-EP   | MA4000/332                | N/A           | N/A      | -   |
| 13. | Antenna Master             | Innco System      | MA-4000XPET | MA4000/509                | N/A           | N/A      | ■   |
| 14. | Loop Antenna               | Schwarzbeck       | FMZB 1513   | 1513-235                  | May 13, 2018  | Two Year | ■   |
| 15. | Frequency Counter          | HP                | 53152A      | US39270295                | Aug. 23, 2018 | One Year | ■   |
| 16. | Environmental Test Chamber | ESPEC             | PSL-2KP     | 14009407                  | Feb. 22, 2019 | One Year | ■   |
| 17. | DC Power Supply            | Protek            | PWS-3003D   | 4020409                   | Aug. 24, 2018 | One Year | ■   |