

# EMF TEST REPORT

**Test Report No.** : OT-205-RWD-003

**AGR No.** : A201A-205R

**Applicant** : openit Inc.

**Address** : 6F HumanTeco, 57, Ahasan17gil, Seongdong-gu, Seoul 04799, Republic of Korea

**Manufacturer** : openit Inc.

**Address** : 6F HumanTeco, 57, Ahasan17gil, Seongdong-gu, Seoul 04799, Republic of Korea

**Type of Equipment** : Healthcare IoT Gateway

**FCC ID.** : 2AVY3BT5UW100

**Model Name** : HealthUp OG-BT5UW100

**Multiple Model Name** : N/A

**Serial number** : N/A

**Total page of Report** : 7 pages (including this page)

**Date of Incoming** : February 07, 2020

**Date of issue** : May 06, 2020

## SUMMARY

The equipment complies with the regulation; **FCC PART 15 SUBPART C Section 15.247**

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:



Ha-Ram Lee / Manager  
ONETECH Corp.

Approved by:



Jae-Ho Lee / General Manager  
ONETECH Corp.

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### Revision History

| Rev. No. | Issued Report No. | Issued Date    | Revisions                             | Section Affected                    |
|----------|-------------------|----------------|---------------------------------------|-------------------------------------|
| 0        | OT-204-RWD-039    | April 07, 2020 | Initial Issue                         | All                                 |
| 1        | OT-205-RWD-003    | May 06, 2020   | Revised the maximum peak output power | 4.3 Calculated MPE<br>Safe Distance |
|          |                   |                |                                       |                                     |

## 1. VERIFICATION OF COMPLIANCE

Applicant : openit Inc.

Address : 6F HumanTeco, 57, Ahasan17gil, Seongdong-gu, Seoul 04799, Republic of Korea

Contact Person : MIN-YOUNG KIM / CEO

Telephone No. : +82-1566-5911

FCC ID : 2AVY3BT5UW100

Model Name : HealthUp OG-BT5UW100

Brand Name : Healthup

Serial Number : N/A

Date : May 06, 2020

|                                                         |                                      |
|---------------------------------------------------------|--------------------------------------|
| EQUIPMENT CLASS                                         | DTS – DIGITAL TRNSMISSION SYSTEM     |
| E.U.T. DESCRIPTION                                      | Healthcare IoT Gateway               |
| THIS REPORT CONCERNS                                    | Original Grant                       |
| MEASUREMENT PROCEDURES                                  | ANSI C63.10: 2013                    |
| TYPE OF EQUIPMENT TESTED                                | Pre-Production                       |
| KIND OF EQUIPMENT<br>AUTHORIZATION REQUESTED            | Certification                        |
| EQUIPMENT WILL BE OPERATED<br>UNDER FCC RULES PART(S)   | FCC PART 15 SUBPART C Section 15.247 |
| Modifications on the Equipment to Achieve<br>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. GENERAL INFORMATION

### 2.1 Product Description

The openit Inc., Model HealthUp OG-BT5UW100 (referred to as the EUT in this report) is a Healthcare IoT Gateway. Product specification information described herein was obtained from product data sheet or user's manual.

|                                                    |                        |                                                                            |           |
|----------------------------------------------------|------------------------|----------------------------------------------------------------------------|-----------|
| Device Type                                        | Healthcare IoT Gateway |                                                                            |           |
| Operating Frequency                                | Bluetooth LE           | 2 402 MHz ~ 2 480 MHz                                                      |           |
|                                                    | WLAN 2.4 GHz           | 2 412 MHz ~ 2 462 MHz [802.11b/g/n(HT20)/n(HT40)]                          |           |
| RF Output Power                                    | Bluetooth LE           | 1 Mbps                                                                     | -2.22 dBm |
|                                                    |                        | 2 Mbps                                                                     | -2.23 dBm |
|                                                    |                        | Coded (125 kHz)                                                            | -2.24 dBm |
|                                                    |                        | Coded (500 kHz)                                                            | -2.24 dBm |
|                                                    | WLAN 2.4 GHz           | 802.11b                                                                    | 23.95 dBm |
|                                                    |                        | 802.11g                                                                    | 22.36 dBm |
|                                                    |                        | 802.11n(HT20)                                                              | 22.29 dBm |
|                                                    |                        | 802.11n(HT40)                                                              | 21.71 dBm |
| Number of Channel                                  | Bluetooth LE           | 40 Channels                                                                |           |
|                                                    | WLAN 2.4 GHz           | 11 Channels                                                                |           |
| Modulation Type                                    | Bluetooth LE           | GFSK                                                                       |           |
|                                                    | WLAN 2.4 GHz           | DSSS Modulation(DBPSK/DQPSK/CCK)<br>OFDM Modulation(BPSK/QPSK/16QAM/64QAM) |           |
| Antenna Type                                       | Bluetooth LE           | PCB Antenna                                                                |           |
|                                                    | WLAN 2.4 GHz           |                                                                            |           |
| Antenna Gain                                       | Bluetooth LE           | -0.28 dBi                                                                  |           |
|                                                    | WLAN 2.4 GHz           | 0.48 dBi                                                                   |           |
| List of each Osc. or crystal Freq.(Freq. >= 1 MHz) | 40 MHz                 |                                                                            |           |
| Rated Supply Voltage                               | DC 5.0 V               |                                                                            |           |

### 2.2 Alternative type(s)/model(s); also covered by this test report.

-. None

## 3. EUT MODIFICATIONS

-. None

## 4. MAXIMUM PERMISSIBLE EXPOSURE

### 4.1 RF Exposure Calculation

According to the FCC rule §1.1310, the limit for General Population/Uncontrolled exposure is 1 mW/cm<sup>2</sup> for the device operating 1 500 ~ 100 000 MHz.

### 4.2 EUT Description

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                 |           |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------|
| Kind of EUT                 | Healthcare IoT Gateway                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                 |           |
| Operating Frequency Band    | <div><input type="checkbox"/> Wireless Microphone: 494.000 MHz ~ 501.000 MHz<br/>and 498.200 MHz ~ 505.200 MHz</div> <div><input checked="" type="checkbox"/> WLAN: 2 412 MHz ~ 2 462 MHz</div> <div><input type="checkbox"/> WLAN: 2 422 MHz ~ 2 452 MHz</div> <div><input type="checkbox"/> WLAN: 5 180 MHz ~ 5 240 MHz</div> <div><input type="checkbox"/> WLAN: 5 745 MHz ~ 5 825 MHz</div> <div><input type="checkbox"/> Bluetooth: 2 402 MHz ~ 2 480 MHz</div> <div><input checked="" type="checkbox"/> Bluetooth BLE: 2 402 MHz ~ 2 480 MHz</div> <div><input type="checkbox"/> NFC : 13.56 MHz</div> |                 |           |
| MAX. RF OUTPUT POWER        | Bluetooth LE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1 Mbps          | -2.22 dBm |
|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 2 Mbps          | -2.23 dBm |
|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Coded (125 kHz) | -2.24 dBm |
|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Coded (500 kHz) | -2.24 dBm |
|                             | WLAN 2.4 GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 802.11b         | 23.95 dBm |
|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 802.11g         | 22.36 dBm |
|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 802.11n(HT20)   | 22.29 dBm |
|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 802.11n(HT40)   | 21.71 dBm |
| Antenna Gain                | Bluetooth LE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | -0.28 dBi       |           |
|                             | WLAN 2.4 GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0.48 dBi        |           |
| Exposure Evaluation Applied | <div><input checked="" type="checkbox"/> MPE</div> <div><input type="checkbox"/> SAR</div> <div><input type="checkbox"/> SAR Test Exclusion Evaluation</div>                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                 |           |

### 4.3 Calculated MPE Safe Distance

According to above equation, the following result was obtained.

| Operating Freq. Band | Operating Mode               | Target Power W/tolerance | Max tune up power |        | Antenna Gain |        | Safe Distance (cm) | Power Density (mW/cm <sup>2</sup> ) @ 20 cm Separation | Limit (mW/cm <sup>2</sup> ) |
|----------------------|------------------------------|--------------------------|-------------------|--------|--------------|--------|--------------------|--------------------------------------------------------|-----------------------------|
|                      |                              | (dBm)                    | (dBm)             | (mW)   | Log          | Linear |                    |                                                        |                             |
| 2 400 ~ 2 483.5      | Bluetooth LE (1 Mbps)        | -2.22 ± 0.5              | -1.72             | 0.67   | -0.28        | 0.938  | 0.22               | 0.000 126                                              | 1.00                        |
| 2 400 ~ 2 483.5      | Bluetooth LE (2 Mbps)        | -2.23 ± 0.5              | -1.73             | 0.67   | -0.28        | 0.938  | 0.22               | 0.000 125                                              | 1.00                        |
| 2 400 ~ 2 483.5      | Bluetooth LE (Coded 125 kHz) | -2.24 ± 0.5              | -1.74             | 0.67   | -0.28        | 0.938  | 0.22               | 0.000 125                                              | 1.00                        |
| 2 400 ~ 2 483.5      | Bluetooth LE (Coded 500 kHz) | -2.24 ± 0.5              | -1.74             | 0.67   | -0.28        | 0.938  | 0.22               | 0.000 125                                              | 1.00                        |
| 2 400 ~ 2 483.5      | WLAN 802.11b                 | 23.95 ± 0.5              | 24.45             | 278.61 | 0.48         | 1.117  | 4.97               | 0.061 9                                                | 1.00                        |
| 2 400 ~ 2 483.5      | WLAN 802.11g                 | 22.36 ± 0.5              | 22.86             | 193.20 | 0.48         | 1.117  | 4.14               | 0.042 9                                                | 1.00                        |
| 2 400 ~ 2 483.5      | WLAN 802.11n(HT20)           | 22.29 ± 0.5              | 22.79             | 190.11 | 0.48         | 1.117  | 4.11               | 0.042 2                                                | 1.00                        |
| 2 400 ~ 2 483.5      | WLAN 802.11n(HT40)           | 21.71 ± 0.5              | 22.21             | 166.34 | 0.48         | 1.117  | 3.84               | 0.037 0                                                | 1.00                        |

According to above table, for 2 400 ~ 2 483.5 MHz Band (WLAN 802.11b), safe distance,

$$D = 0.282 * \sqrt{(278.61 * 1.117)/1.00} = 4.97 \text{ cm}$$

For getting power density at 20 cm separation in above table, following formula was used.

$$S = P * G / (4\pi * R^2) = 278.61 * 1.117 / (4 * 3.14 * 20^2) = 0.061 9$$

Where:

S = Power Density,

P = Power input to the external antenna (Output power from the EUT antenna port (dBm) – cable loss (dB)),

G = Gain of Transmit Antenna (linear gain), R = Distance from Transmitting Antenna



Tested by: Ha-Ram Lee / Manager