

# ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LOW-POWER, NON-LICENSED TRANSMITTER

Test Report No. : OT-18N-RWD-002

AGR No. : A186A-440

Applicant : OSSTEM IMPLANT Co., Ltd.

Address : 2 Floor, B-dong, 51, Mayu-ro 238beon-gil, Siheung-si, Gyeonggi-do, 15079, Republic of Korea

Manufacturer : Danbitech Co., Ltd.

Address : 120, Daeseong-ro 180beon-gil, Sangdang-gu, Cheongju-si, Chungcheongbuk-do, Korea

Type of Equipment : Wireless Module

FCC ID. : 2ARZCURM01

Model Name : URM01

Serial number : N/A

Total page of Report : 8 pages (including this page)

Date of Incoming : June 28, 2018

Date of issue : November 05, 2018

## SUMMARY

The equipment complies with the regulation; *FCC PART 15 SUBPART F Section 15.521*

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

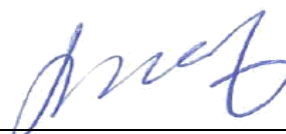
It is not a generally valid assessment of the features of the respective products of the mass-production.

Reviewed by:



Jae-Ho Lee / Chief Engineer  
ONETECH Corp.

Approved by:



Keun-Young, Choi / Vice President  
ONETECH Corp.

## CONTENTS

**PAGE**

|   |          |
|---|----------|
| <b>1. VERIFICATION OF COMPLIANCE .....</b>                                      | <b>4</b> |
| <b>2. GENERAL INFORMATION.....</b>  | <b>5</b> |
| <b>2.1 PRODUCT DESCRIPTION.....</b>   | <b>5</b> |
| <b>2.2 ALTERNATIVE TYPE(S)/MODEL(S); ALSO COVERED BY THIS TEST REPORT. ....</b> | <b>5</b> |
| <b>3. EUT MODIFICATIONS.....</b>  | <b>5</b> |
| <b>4. MAXIMUM PERMISSIBLE EXPOSURE.....</b>                                     | <b>6</b> |
| <b>4.1 RF EXPOSURE CALCULATION .....</b>  | <b>6</b> |
| <b>4.2 EUT DESCRIPTION.....</b>   | <b>7</b> |
| <b>4.3 CALCULATED MPE SAFE DISTANCE.....</b>                                    | <b>8</b> |

**Revision History**

| Issued Report No. | Issued Date       | Revisions     | Effect Section |
|-------------------|-------------------|---------------|----------------|
| OT-18N-RWD-002    | November 05, 2018 | Initial Issue | All            |
|                   |                   |               |                |
|                   |                   |               |                |

## 1. VERIFICATION OF COMPLIANCE

Applicant : OSSTEM IMPLANT Co., Ltd.  
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Contact Person : Moo Yong Park / Director  
Telephone No. : +82-2-2016-7000  
FCC ID : 2ARZCURM01  
Model Name : URM01  
Serial Number : N/A  
Date : November 05, 2018

|  |  |
|--|--|
| EQUIPMENT CLASS                                      | <b><i>UWB – ULTRA WIDEBAND TRANSMITTER</i></b> |
| E.U.T. DESCRIPTION                                   | Wireless Module                                |
| 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 PART 15 SUBPART F Section 15.521           |
| 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. GENERAL INFORMATION

### 2.1 Product Description

The OSSTEM IMPLANT Co., Ltd., Model URM01 (referred to as the EUT in this report) is an Wireless Module. Product specification information described herein was obtained from product data sheet or user's manual.

|  |                        |
|--|------------------------|
| DEVICE TYPE  | Wireless Module        |
| OPERATING FREQUENCY  | 7.2 GHz ~ 10.2 GHz     |
| RF OUTPUT POWER  | 85.77 dB $\mu$ V/m     |
| MODULATION TYPE  | OFDM                   |
| ANTENNA TYPE   | PCB Pattern Antenna    |
| ANTENNA GAIN   | 0.09 dBi               |
| LIST OF EACH OSC. OR CRYSTAL.<br>FREQ.(FREQ. $\geq$ 1 MHz) | 12 MHz, 24 MHz, 44 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 table 1B, the limit for the maximum permissible RF exposure for an uncontrolled environment are  $f/1500 \text{ mW/cm}^2$  for the frequency range between 300 MHz and 1 500 MHz and  $1.0 \text{ mW/cm}^2$  for the frequency range between 1 500 MHz and 100 000 MHz.

The electric field generated for a  $1 \text{ mW/cm}^2$  exposure is calculated as follows:

$$E = \sqrt{(30 * P * G) / d}, \text{ and } S = E^2 / Z = E^2 / 377, \text{ because } 1 \text{ mW/cm}^2 = 10 \text{ W/m}^2$$

Where

$S$  = Power density in  $\text{mW/cm}^2$ ,  $Z$  = Impedance of free space,  $377 \Omega$

$E$  = Electric field strength in  $\text{V/m}$ ,  $G$  = Numeric antenna gain, and  $d$  = distance in meter

Combining equations and rearranging the terms to express the distance as a function of the remaining variable

$$d = \sqrt{(30 * P * G) / (377 * 10 S)}$$

Changing to units of  $\text{mW}$  and  $\text{cm}$ , using  $P (\text{mW}) = P (\text{W}) / 1 000$ ,  $d (\text{cm}) = 0.01 * d (\text{m})$

$$d = 0.282 * \sqrt{(P * G) / S}$$

Where

$d$  = distance in  $\text{cm}$ ,  $P$  = Power in  $\text{mW}$ ,  $G$  = Numeric antenna gain, and  $S$  = Power density in  $\text{mW/cm}^2$

#### 4.2 EUT Description

|                                |   |
|--------------------------------|---|
| Kind of EUT                    | Wireless Module   |
| Operating Frequency Band       | <input type="checkbox"/> Wireless Microphone: 494.000 MHz ~ 501.000 MHz<br>and 498.200 MHz ~ 505.200 MHz<br><input type="checkbox"/> WLAN: 2 412 MHz ~ 2 462 MHz<br><input type="checkbox"/> WLAN: 5 180 MHz ~ 5 240 MHz<br><input type="checkbox"/> WLAN: 5 745 MHz ~ 5 825 MHz<br><input type="checkbox"/> Bluetooth: 2 402 MHz ~ 2 480 MHz<br><input type="checkbox"/> Bluetooth BLE: 2 402 MHz ~ 2 480 MHz<br><input checked="" type="checkbox"/> UWB: 7 200 MHz ~ 10 200 MHz |
| MAX. RF OUTPUT POWER           | 85.77 dBuV/m (-21.22 dBm @ 1 m)   |
| Antenna Gain                   | 0.09 dBi  |
| Exposure<br>Evaluation Applied | <input checked="" type="checkbox"/> MPE<br><input type="checkbox"/> SAR<br><input type="checkbox"/> N/A   |

### 4.3 Calculated MPE Safe Distance

According to above equation, the following result was obtained.

| Operating<br>Freq. Band<br>(MHz) | Operating Mode | Target Power<br>W/tolerance | Max tune up<br>power |         | Antenna Gain |        | Power Density<br>(mW/cm <sup>2</sup> )<br>@ 20 cm<br>Separation | Limit<br>(mW/cm <sup>2</sup> ) |
|----------------------------------|----------------|-----------------------------|----------------------|---------|--------------|--------|---|--------------------------------|
|                                  |                | (dBm)                       | (dBm)                | (mW)    | Log          | Linear |   |                                |
| 7 200<br>~ 10 200                | UWB            | -20.72 ± 0.5                | -21.22               | 0.007 6 | 0.09         | 1.021  | 0.000 001 5   | 1.00                           |



**Tested by: Min-Gu, Ji / Assistant Manager**