

## RF Exposure Report

**Report No.:** SABHAT-WTW-P21030696 R1

**FCC ID:** R68OQ660US

**Test Model:** Open-Q 660 uSOM

**Received Date:** Mar. 18, 2021

**Date of Evaluation:** Jul. 29, 2021

**Issued Date:** Nov. 08, 2021

**Applicant:** Lantronix, Inc.

**Address:** 7535 Irvine Center Drive, Suite 100, Irvine, CA 92618 USA

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Lin Kou Laboratories

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**Test Location:** No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City  
33383, Taiwan

**FCC Registration /** 788550 / TW0003  
**Designation Number:**



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.

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### Release Control Record

| Issue No.               | Description      | Date Issued   |
|-------------------------|------------------|---------------|
| SABHAT-WTW-P21030696    | Original Release | Sep. 10, 2021 |
| SABHAT-WTW-P21030696 R1 | Revise Applicant | Nov. 08, 2021 |

## 1 Certificate of Conformity

**Product:** Open-Q 660 uSOM

**Brand:** Lantronix

**Test Model:** Open-Q 660 uSOM

**Sample Status:** Engineering Sample

**Applicant:** Lantronix, Inc.

**Date of Evaluation:** Jul. 29, 2021

**Standards:** FCC Part 2 (Section 2.1091)

**References Test Guidance:** KDB 447498 D01 General RF Exposure Guidance v06

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.



**Prepared by :** \_\_\_\_\_, **Date:** Nov. 08, 2021  
Lena Wang / Specialist



**Approved by :** \_\_\_\_\_, **Date:** Nov. 08, 2021  
Dylan Chiou / Senior Engineer

## 2 RF Exposure

### 2.1 Limits for Maximum Permissible Exposure (MPE)

| Frequency Range (MHz)                                 | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm <sup>2</sup> ) | Average Time (minutes) |
|---|-------------------------------|-------------------------------|-------------------------------------|------------------------|
| Limits For General Population / Uncontrolled Exposure |                               |                               |                                     |                        |
| 300-1500  | ...                           | ...                           | F/1500                              | 30                     |
| 1500-100,000  | ...                           | ...                           | 1.0                                 | 30                     |

F = Frequency in MHz

### 2.2 MPE Calculation Formula

$$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$$

where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

R = distance between observation point and center of the radiator in cm

### 2.3 Classification

The antenna of this product, under normal use condition, is at least 21cm away from the body of the user. So, this device is classified as **Mobile Device**.

### 3 Calculation Result of Maximum Conducted Power

| Frequency Band (MHz) | Max Average Power (dBm) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|----------------------|-------------------------|--------------------|---------------|-------------------------------------|-----------------------------|
| <b>WLAN</b>          |                         |                    |               |                                     |                             |
| CDD Mode             |                         |                    |               |                                     |                             |
| 2412-2462            | 26.82                   | 6.33               | 21            | 0.373                               | 1                           |
| 5180-5240            | 16.72                   | 9.12               | 21            | 0.069                               | 1                           |
| 5260-5320            | 16.87                   | 9.12               | 21            | 0.072                               | 1                           |
| 5500-5720            | 23.38                   | 9.12               | 21            | 0.321                               | 1                           |
| 5745-5825            | 26.14                   | 9.12               | 21            | 0.606                               | 1                           |
| Beamforming Mode     |                         |                    |               |                                     |                             |
| 2412-2462            | 24.69                   | 6.33               | 21            | 0.228                               | 1                           |
| 5180-5240            | 13.77                   | 9.12               | 21            | 0.035                               | 1                           |
| 5260-5320            | 16.87                   | 9.12               | 21            | 0.072                               | 1                           |
| 5500-5720            | 20.78                   | 9.12               | 21            | 0.176                               | 1                           |
| 5745-5825            | 26.14                   | 9.12               | 21            | 0.606                               | 1                           |
| <b>BT EDR</b>        |                         |                    |               |                                     |                             |
| 2402-2480            | 12.51                   | 3.32               | 21            | 0.007                               | 1                           |
| <b>BT LE</b>         |                         |                    |               |                                     |                             |
| 2402-2480            | 11.41                   | 3.32               | 21            | 0.005                               | 1                           |

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

Note:

1. Directional gain:

2.4GHz Band:  $=3.32\text{dBi} + 10\log(2)= 6.33\text{dBi}$

5GHz: Directional Gain =  $6.11\text{dBi} + 10\log(2)=9.12\text{dBi}$

BT antenna gain: 3.32dBi

2. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

**Conclusion:**

The formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

The simultaneous operation mode was determined by client.

1. WLAN 2.4G+ 5GHz =  $0.373/1 + 0.606/1 = 0.979$
2. WLAN 2.4G+ BT =  $0.373/1 + 0.007/1 = 0.380$
3. WLAN 5G+ BT =  $0.606/1 + 0.007/1 = 0.613$

Therefore the maximum calculations of above situations are less than the "1" limit.

**---END---**