# RF Exposure Report

**Report No.:** SA160601C24

**FCC ID:** XCNUBC1301

**Test Model:** UBC1301

**Received Date:** June 01, 2016

**Test Date:** July 20, 2016

**Issued Date:** Aug. 25, 2016

**Applicant:** Ubee Interactive Corp.

**Address:** 10F-1, No. 5, Taiyuan 1st St. Jhubei City, Hsinchu County 302, Taiwan, R.O.C.

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory

**Lab Address:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.

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## Release Control Record

| Issue No. | Description | Date Issued |
|---|---|---|
| SA160601C24 | Original release. | Aug. 25, 2016 |

## 1 Certificate of Conformity

| | |
|---|---|
| **Product:** | Wireless eMTA |
| **Brand:** | Ubee |
| **Test Model:** | UBC1301 |
| **Sample Status:** | ENGINEERING SAMPLE |
| **Applicant:** | Ubee Interactive Corp. |
| **Test Date:** | July 20, 2016 |
| **Standards:** | FCC Part 2 (Section 2.1091)<br>KDB 447498 D01 General RF Exposure Guidance v06<br>IEEE C95.1-1992 |

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 EMC characteristics under the conditions specified in this report.

**Prepared by :** _____ , **Date:** Aug. 25, 2016

Midoli Peng / Specialist

**Approved by :** _____ , **Date:** Aug. 25, 2016

May Chen / Manager

## 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 ($mW/cm^2$) | 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

$Pd = (Pout*G) / (4*pi*r^2)$

where

Pd = power density in $mW/cm^2$

Pout = 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 30cm away from the body of the user. So, this device is classified as **Mobile Device**.

## 2.4 Antenna Gain

| Frequency (MHz) | Ant 1<br>2.4GHz (Chain 0) / 5GHz (Chain 3) | | Ant 2<br>2.4GHz (Chain 1) / 5GHz (Chain 2) | |
|---|---|---|---|---|
| | Peak Gain (dBi) | Efficiency (%) | Peak Gain (dBi) | Efficiency (%) |
| **2400** | 3.1 | 69.4 | 4.0 | 65.5 |
| **2450** | 3.5 | 68.0 | 4.0 | 65.0 |
| **2500** | 3.9 | 63.5 | 3.5 | 69.9 |
| **5050** | 4.5 | 73.3 | 4.9 | 63.1 |
| **5150** | 4.8 | 71.7 | 4.9 | 64.7 |
| **5350** | 4.4 | 70.8 | 4.2 | 72.5 |
| **5725** | 4.7 | 67.0 | 4.6 | 67.6 |
| **5825** | 4.3 | 67.1 | 4.3 | 69.6 |

| Frequency (MHz) | Ant 3<br>2.4GHz (Chain 2) / 5GHz (Chain 1) | | Ant 4<br>2.4GHz (Chain 3) / 5GHz (Chain 0) | |
|---|---|---|---|---|
| | Peak Gain (dBi) | Efficiency (%) | Peak Gain (dBi) | Efficiency (%) |
| **2400** | 3.9 | 66.1 | 3.9 | 63.0 |
| **2450** | 3.4 | 66.8 | 3.8 | 65.3 |
| **2500** | 3.8 | 67.0 | 3.8 | 65.2 |
| **5050** | 4.8 | 67.5 | 4.9 | 62.4 |
| **5150** | 4.8 | 69.1 | 4.7 | 70.2 |
| **5350** | 4.7 | 69.4 | 4.9 | 63.4 |
| **5725** | 4.9 | 64.9 | 4.9 | 62.1 |
| **5825** | 4.9 | 63.9 | 4.9 | 64.2 |

2.5 Calculation Result Of Maximum Conducted Power

| Frequency Band (MHz) | Max Power (mW) | Antenna Gain (dBi) | Distance (cm) | Power Density ($mW/cm^2$) | Limit ($mW/cm^2$) |
|---|---|---|---|---|---|
| 2412-2462 | 346.172 | 9.95 | 30 | 0.30258 | 1 |
| 5180-5240 | 474.593 | 10.82 | 30 | 0.50684 | 1 |
| 5745-5825 | 558.098 | 10.8 | 30 | 0.59328 | 1 |

Note: 1. For 2.4: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4] = 9.95$dBi.
2. For 5GHz (UNII-1): Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4] = 10.82$dBi.
3. For 5GHz (UNII-3): Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / 4] = 10.8$dBi.

**Conclusion:**

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + WLAN 5GHz = 0.30258 /1 + 0.59328 / 1 = 0.89586

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

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