

## RF Exposure Report

**Report No.:** SABEMV-WTW-P20070304

**FCC ID:** XCNUBC1329

**Test Model:** UBC1329

**Received Date:** July 15, 2020

**Test Date:** July 26, 2020

**Issued Date:** Aug. 06, 2020

**Applicant:** Ubee Interactive Corp.

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R.O.C.

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

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Taiwan

**Test Location:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan

**FCC Registration /  
Designation Number:** 723255 / TW2022

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### Release Control Record

| Issue No.            | Description       | Date Issued   |
|----------------------|-------------------|---------------|
| SABEMV-WTW-P20070304 | Original release. | Aug. 06, 2020 |

## 1 Certificate of Conformity

**Product:** DOCSIS 3.1 Advanced WiFi 6 Voice Gateway  
**Brand:** Ubee  
**Test Model:** UBC1329  
**Sample Status:** Mass product  
**Applicant:** Ubee Interactive Corp.  
**Test Date:** July 26, 2020  
**Standards:** FCC Part 2 (Section 2.1091)  
IEEE C95.3 -2002  
**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 EMC characteristics under the conditions specified in this report.

**Prepared by :** Cherry Chuo , **Date:** Aug. 06, 2020  
Cherry Chuo / Specialist

**Approved by :** Clark Lin , **Date:** Aug. 06, 2020  
Clark Lin / Technical 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 <sup>2</sup> ) | Average Time (minutes) |
|---|-------------------------------|-------------------------------|-------------------------------------|------------------------|
| Limits For General Population / Uncontrolled Exposure |                               |                               |                                     |                        |
| 0.3-1.34  | 614                           | 1.63                          | (100)*                              | 30                     |
| 1.34-30   | 824/f                         | 2.19/f                        | (180/f <sup>2</sup> )*              | 30                     |
| 30-300  | 27.5                          | 0.073                         | 0.2                                 | 30                     |
| 300-1500  | ...                           | ...                           | f/1500                              | 30                     |
| 1500-100,000  | ...                           | ...                           | 1.0                                 | 30                     |

f = Frequency in MHz ; \*Plane-wave equivalent power density

### 2.2 MPE Calculation Formula

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

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

## 2.4 Antenna Gain

| Antenna NO. | RF Chain NO.<br>ex. Chain0/1 | Frequency Range<br>(GHz) | Antenna Gain<br>(dBi) | Antenna Type | Connector Type |
|-------------|------------------------------|--------------------------|-----------------------|--------------|----------------|
| 1           | 2G Chain 0 / 5G Chain 2      | 2.4~2.4835               | 3.79                  | PCB          | i-pex(MHF)     |
|             |                              | 5.15~5.25                | 1.61                  |              |                |
|             |                              | 5.725~5.85               | 1.01                  |              |                |
| 2           | 5G Chain3                    | 2.4~2.4835               | NA                    | PCB          | i-pex(MHF)     |
|             |                              | 5.15~5.25                | 2.06                  |              |                |
|             |                              | 5.725~5.85               | 1.82                  |              |                |
| 3           | 2G Chain 1 / 5G Chain 1      | 2.4~2.4835               | 3.07                  | PCB          | i-pex(MHF)     |
|             |                              | 5.15~5.25                | 2.76                  |              |                |
|             |                              | 5.725~5.85               | 1.24                  |              |                |
| 4           | 2G Chain 2 / 5G Chain 0      | 2.4~2.4835               | 3.5                   | PCB          | i-pex(MHF)     |
|             |                              | 5.15~5.25                | 3.26                  |              |                |
|             |                              | 5.725~5.85               | 3.36                  |              |                |

\* 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.

## 2.5 Calculation Result

| Operation Mode      | Evaluation Frequency (MHz) | Max. Average Power (mW) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|---------------------|----------------------------|-------------------------|--------------------|---------------|-------------------------------------|-----------------------------|
| WLAN 2.4GHz         | 2412~2462                  | 960.327                 | 8.23               | 35            | 0.41502                             | 1                           |
| WLAN 5GHz (U-NII-1) | 5180~5250                  | 963.474                 | 8.47               | 35            | 0.44004                             | 1                           |
| WLAN 5GHz (U-NII-3) | 5745~5825                  | 971.53                  | 7.93               | 35            | 0.39184                             | 1                           |

Note:

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- 2.4GHz: The directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} / 3)] = 8.23 \text{ dBi}$
- 5GHz(U-NII-1): The directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20} / 4)] = 8.47 \text{ dBi}$   
 5GHz(U-NII-3): The directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20} / 4)] = 7.93 \text{ dBi}$

**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

$$WLAN 2.4GHz + 5GHz = 0.41502 / 1 + 0.44004 / 1 = 0.85506$$

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

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