

## RF Exposure Report

**Report No.:** SA190218E06

**FCC ID:** XCNUBC1319

**Test Model:** UBC1319

**Received Date:** Feb. 18, 2019

**Test Date:** Apr. 09, 2019

**Issued Date:** May 03, 2019

**Applicant:** Ubee Interactive Corp.

**Address:** 10F-1, No. 5, Taiyuan 1st St. Jhubei Ci, 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.

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

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

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### Release Control Record

Issue No.	Description	Date Issued
SA190218E06	Original release.	May 03, 2019

## 1 Certificate of Conformity

**Product:** DOCSIS 3.0 Wireless eMTA

**Brand:** Ubee

**Test Model:** UBC1319

**Applicant:** Ubee Interactive Corp.

**Test Date:** Apr. 09, 2019

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

KDB 447498 D01 General RF Exposure Guidance v06

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 :** Phoenix Huang, **Date:** May 03, 2019  
Phoenix Huang / Specialist

**Approved by :** May Chen, **Date:** May 03, 2019  
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 <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

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

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

## 2.4 Antenna Gain

Antenna No	Transmitter Circuit	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type	Cable Length (mm)
1	5GHz: Chain 0	2.93	5.15~5.25	Dipole	i-Pex	71
		2.5	5.25~5.35			
		2.04	5.47~5.725			
		2.04	5.725~5.85			
2	2.4GHz: Chain 2	1.67	2.4~2.4825	Dipole	i-Pex	132
	5GHz: Chain 1	1.99	5.15~5.25			
		3.2	5.25~5.35			
		2.99	5.47~5.725			
3	5GHz: Chain 2	3.17	5.725~5.85	Dipole	i-Pex	110
		2.47	2.4~2.4825			
		4.22	5.15~5.25			
		3.52	5.25~5.35			
4	5GHz: Chain 3	3.59	5.47~5.725	Dipole	i-Pex	90
		4.54	5.725~5.85			
		2.49	2.4~2.4825			
		3.82	5.15~5.25			
		2.88	5.25~5.35			
		3.64	5.47~5.725			
		3.64	5.725~5.85			

## 2.5 Calculation Result of Maximum Conducted Power

Operation Mode	Evaluation Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
WLAN 2.4GHz	2412	631.707	6.99	30	0.27929	1
WLAN 5GHz (U-NII-1)	5200	447.454	9.3	30	0.33674	1
WLAN 5GHz (U-NII-3)	5755	788.288	9.41	30	0.60846	1

Note:

2.4GHz: The directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20})^2 / 3] = 6.99\text{dBi}$

5GHz:

U-NII-1: The directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4] = 9.3\text{dBi}$

U-NII-3: The directional gain =  $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4] = 9.41\text{dBi}$

### Conclusion:

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

$\text{WLAN 2.4GHz} + \text{WLAN 5GHz} = 0.27929 / 1 + 0.60846 / 1 = 0.88775$

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

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