RF Exposure Report

Report No.:	SA190218E06A
FCC ID:	XCNUBC1319
Test Model:	UBC1319
Received Date:	May 09, 2019
Test Date:	July 22, 2019
Issued Date:	Dec. 10, 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
SA190218E06A	Original release.	Dec. 10, 2019

1   Certificate of Conformity

Product: DOCSIS 3.0 Wireless eMTA

Brand: Ubee

Test Model: UBC1319

Applicant: Ubee Interactive Corp.

Test Date: July 22, 2019
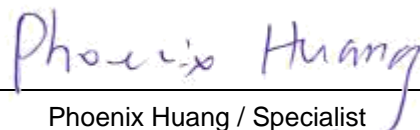
Standards: FCC Part 2 (Section 2.1091)

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:** Dec. 10, 2019

Phoenix Huang / Specialist

Approved by : _____ , **Date:** Dec. 10, 2019

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^2)	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^2)*	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

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

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			
		3.17	5.725~5.85			
3	2.4GHz: Chain 1	2.47	2.4~2.4825	Dipole	i-Pex	110
	5GHz: Chain 2	4.22	5.15~5.25			
		3.52	5.25~5.35			
		3.59	5.47~5.725			
		4.54	5.725~5.85			
4	2.4GHz: Chain 0	2.49	2.4~2.4825	Dipole	i-Pex	90
	5GHz: Chain 3	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

For 2.4GHz, 5GHz (U-NII-1, U-NII-3) data was copied from the original test report (Report No.: SA190218E06)

Operation Mode	Evaluation Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
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-2A)	5270	236.051	9.05	30	0.16771	1
WLAN 5GHz (U-NII-2C)	5610	239.7	9.11	30	0.17267	1
WLAN 5GHz (U-NII-3)	5755	788.288	9.41	30	0.60846	1

Note:

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

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

   5GHz:

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

   U-NII-2A: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4]$ = 9.05dBi

   U-NII-2C: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2 / 4]$ = 9.11dBi

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

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 = 0.27929 / 1 + 0.60846 / 1 = 0.88775

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

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