

## RF Exposure Report

**Report No.:** SA180509C32A

**FCC ID:** 2ABRC-ACWZZN

**Test Model:** ACWZZN

**Series Model:** WUSB (Refer to section 2 for more detail)

**Received Date:** May 17, 2018

**Date of Evaluation:** Jun. 05, 2018

**Issued Date:** Jun. 19, 2018

**Applicant:** Optoma Corporation

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

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

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



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### Release Control Record

Issue No.	Description	Date Issued
SA180509C32A	Original Release	Jun. 19, 2018

## 1 Certificate of Conformity

**Product:** WIRELESS DONGLE MODULE

**Brand:** Optoma

**Test Model:** ACWZZN

**Series Model:** WUSB (Refer to section 2 for more detail)

**Sample Status:** Identical Prototype

**Applicant:** Optoma Corporation

**Date of Evaluation:** Jun. 05, 2018


**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 :**




**Date:**

Jun. 19, 2018

Rona Chen / Specialist

**Approved by :**



**Date:**

Jun. 19, 2018

Dylan Chiou / Project Engineer

## 2 General Description

Brand	Model	Difference
Optoma	ACWZZN	All models are electrically identical, different model names are for marketing purpose.
	WUSB	

## 3 RF Exposure

### 3.1 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

### 3.2 MPE Calculation Formula

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

where

Pd = power density in mW/cm<sup>2</sup>

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

### 3.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user.

So, this device is classified as **Mobile Device**.

### 3.4 Antenna Gain

PIFA antenna with gain

0.5 dBi (Chain 0)

0.3 dBi (Chain 1)

### 3.5 Calculation Result Of Maximum Conducted Power

Frequency Band (MHz)	Max Power (dBm)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2412-2462	29.90	966.873	3.41	20	0.422	1

**NOTE:**

- 2.4GHz: Directional gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}]$  dBi =  $10 \log[(10^{0.5/20} + 10^{0.3/20})^2 / 2]$  = 3.41 dBi
- The above Max Power is Tune-up Power which client declared.

**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 =  $0.422 / 1 = 0.422$

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

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