

## 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

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

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

### 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.**

--- END ---