

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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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

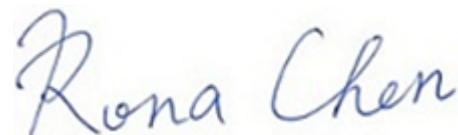
Standards: FCC Part 2 (Section 2.1091)

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.

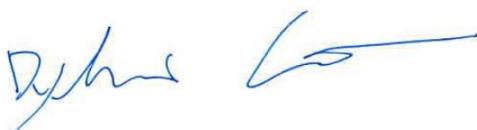
Prepared by :



, **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 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

3.2 MPE Calculation Formula

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

where

Pd = power density in mW/cm²

Pout = output power to antenna in mW

G = gain of antenna in linear scale

π = 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 ²)	Limit (mW/cm ²)
2412-2462	29.90	966.873	3.41	20	0.422	1

NOTE:

1. 2.4GHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}]$ dB_i = $10 \log[(10^{0.5/20} + 10^{0.3/20})^2 / 2] = 3.41$ dB_i
2. 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

$$\text{WLAN 2.4GHz} = 0.422 / 1 = 0.422$$

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

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