

RF Exposure Evaluation Report

Product	: SONOFF Zigbee 3.0 USB Dongle Plus
Trade mark	: SONOFF
Model/Type reference	: ZBDongle-P
Serial Number	: N/A
Report Number	: EED32N80817502
FCC ID	: 2APN5ZBD-P
Date of Issue	: Nov. 26, 2021
Test Standards	: 47 CFR Part 1.1307 47 CFR Part 1.1093 KDB447498D01 General RF Exposure Guidance v06
Test result	: PASS

Prepared for:

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Nov. 26, 2021

Check No.:3006010921

1 Version

Version No.	Date	Description
00	Nov. 26, 2021	Original

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3 General Information

3.1 Client Information

Applicant:	Shenzhen Sonoff Technologies Co.,Ltd.
Address of Applicant:	1001,BLDG8, Lianhua Industrial Park, Shenzhen, GD, China
Manufacturer:	Shenzhen Sonoff Technologies Co.,Ltd.
Address of Manufacturer:	1001,BLDG8, Lianhua Industrial Park, Shenzhen, GD, China
Factory:	Dongguan xinyi Electronics Co., LTD.
Address of Factory:	No.4, Zhangyang Fuzhu First Street, Zhangmutou Town, Dongguan , Guangdong

3.2 General Description of EUT

Product Name:	SONOFF Zigbee 3.0 USB Dongle Plus
Model No.(EUT):	ZBDongle-P
Trade Mark:	SONOFF
EUT Supports Radios application:	2405MHz~2480MHz

3.3 Product Specification subjective to this standard

Frequency Range:	2405MHz~2480MHz
Modulation Type:	O-QPSK
Test Power Grade:	Default
Test Software of EUT:	SmartRF Studio 7
Antenna Type:	RP-SMA antenna
Antenna Gain:	2dBi
Power Supply:	DC 5V
Max Conducted Peak Output Power:	8.96dBm The Max Conducted Peak Output Power data refer to the report EED32N80817501
Sample Received Date:	Sep. 01, 2021
Sample tested Date:	Sep. 01, 2021 to Nov. 12, 2021
Remark: Company Name and Address shown on Report, the sample(s) and sample Information was/ were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified.	

Model No.: ZBDongle-P

Part Name	Model Name	Supplier(Brand)	Remark
USB to serial port chip	CP2102N-A02-GQFN28R	Siliconlabs	Different number of pins, 28 pins
USB to serial port chip	CP2102N-A02-GQFN24R	Siliconlabs	Different number of pins, 24 pins

Only main test ZBDongle-P (CP2102N-A02-GQFN28R)

USB to serial port chip have two specifications , Different number of pins(the change has no influence on RF performance) , Their electrical circuit design, layout and internal wiring are identical.

3.4 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 33683668 Fax: +86 (0) 755 33683385

No tests were sub-contracted.

FCC Designation No.: CN1164

3.5 Deviation from Standards

None.

3.6 Abnormalities from Standard Conditions

None.

3.7 Other Information Requested by the Customer

None.

4 SAR Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

Limits

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$\left[\frac{\text{max. power of channel, including tune-up tolerance, mW}}{(\text{min. test separation distance, mm})} \right] \cdot \sqrt{f(\text{GHz})} \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$$

$f(\text{GHz})$ is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation¹⁷

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion

4.1.2 EUT RF Exposure

The tune-up power is 8.50 dBm +/- 0.5dB, therefore the highest tune-up power is

9.0 dBm (7.94 mW)@2480Mhz

When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

So,

$$(7.94 \text{ mW} / 5\text{mm}) * (2.480\text{GHz}^{0.5}) = 2.5$$

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] * [\sqrt{f(\text{GHz})}] = 2.5 < 3.0$

Therefore, standalone SAR measurements are not required for both head and body.

PHOTOGRAPHS OF EUT Constructional Details

Refer to Report No. EED32N80817501 for EUT external and internal photos.

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CTI, this report can't be reproduced except in full.

*** End of Report ***