RF Exposure Evaluation Report

Report No.: RWAQ202400241I

Applicant: Shenzhen Neutop Optoelectronics Co., Ltd

Address: 502, BLDG 4, Pingshan minQi Technology Park, No. 65 Lishan Road, Pingshan Community,Taoyuan Street, Nanshan District, Shenzhen,Guangdong, China

Product Name: Projector

Product Model: D001

Multiple Models: EAZZE D1, D002, D003,D004,D005

Trade Mark: N/A

FCC ID: 2BEGB-YX02

Standards: 47 CFR §1.1307
KDB 447498 D04 Interim General RF Exposure Guidance v01

Test Date: 2024-04-19

Test Result: Complied

Report Date: 2024-04-19

Reviewed by: Abel Chen

Abel Chen
Project Engineer

Approved by: Jacob Kong

Jacob Kong
Manager

Prepared by:

World Alliance Testing & Certification (Shenzhen) Co., Ltd

No. 1002, East Block, Laobing Building, Xingye Road 3012, Xixiang street, Bao'an District, Shenzhen, Guangdong, People's Republic of China

NVLAP TESTING NVLAP LAB CODE 600335-0

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Revision History

Version No.	Issued Date	Description
00	*2024-04-19*	*Original*

Contents

1 General Information 4

1.1 Client Information 4

1.2 Product Description of EUT 4

1.3 Laboratory Location 5

2 RF Exposure Evaluation 6

2.1 Standard 6

2.2 Result 8

1 General Information

1.1 Client Information

Applicant:	Shenzhen Neutop Optoelectronics Co., Ltd
Address:	502, BLDG 4, Pingshan minQi Technology Park, No. 65 Lishan Road, Pingshan Community,Taoyuan Street, Nanshan District, Shenzhen,Guangdong, China
Manufacturer:	Shenzhen Neutop Optoelectronics Co., Ltd
Address:	502, BLDG 4, Pingshan minQi Technology Park, No. 65 Lishan Road, Pingshan Community,Taoyuan Street, Nanshan District, Shenzhen,Guangdong, China

1.2 Product Description of EUT

The EUT is Projector that contains BT, 2.4G and 5G WLAN radios.

Sample Serial Number	6S-3 (assigned by WATC)
Sample Received Date	2024-03-19
Sample Status	Good Condition
Frequency Range	BT: 2402MHz - 2480MHz 2.4G WLAN: 2412MHz - 2472MHz 5.2G WLAN: 5150 MHz - 5250MHz 5.8G RLAN: 5725MHz – 5850MHz
Maximum Conducted Output Power	BT: 2402MHz - 2480MHz: 7.05dBm 2.4G WLAN: 2412MHz - 2472MHz: 11.76dBm 5.2G WLAN: 5150 MHz - 5250MHz: 13.13dBm 5.8G RLAN: 5725MHz – 5850MHz: 20.83dBm
Modulation Technology	GFSK, π/4 DQPSK, 8DPSK, DSSS, OFDM
Antenna Gain#	BT: 2.47dBi 2.4G WLAN: ANT 1: 4.23dBi; ANT2: 1.75dBi 5G WLAN: ANT1:5.10dBi; ANT2:4.89dBi
Spatial Streams	BT: SISO (1TX, 1RX) 2.4G: MIMO (2TX, 2RX) 5G: MIMO (2TX, 2RX)
Power Supply	DC 21V from adapter
Operating temperature#	0 deg.C to +35 deg.C
Adapter 1 Information	Model: JDA2102850WUS Input: AC100-240V, 50/60Hz, 1.25A Output: DC 21V/2.85A
Adapter 2 Information	Model: Z72A210285US00 Input: AC100-240V, 50/60Hz, 1.5A Output: DC 21V/2.85A
Modification	Sample No Modification by the test lab

1.3 Laboratory Location

World Alliance Testing & Certification (Shenzhen) Co., Ltd

No. 1002, East Block, Laobing Building, Xingye Road 3012, Xixiang street, Bao'an District, Shenzhen, Guangdong, People's Republic of China

Tel: +86-755-29691511, Email: qa@watc.com.cn

The lab has been recognized as the FCC accredited lab under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 463912, the FCC Designation No. : CN5040.

The lab has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements, the CAB identifier: CN0160.

2 RF Exposure Evaluation

2.1 Standard

According to §1.1307(b)(3)(i), For single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

(A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);

(B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold Pth (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). Pth is given by:

$$P_{th}\ (\text{mW}) = \begin{cases} ERP_{20\ cm}(d/20\ \text{cm})^x & d \le 20\ \text{cm} \\ ERP_{20\ cm} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ cm}\sqrt{f}}\right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20\ cm}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

d = the separation distance (cm);

(C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least λ/2π, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of λ/4 or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

Table 1 to § 1.1307(b)(3)(i)(C)—Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3–1.34	1,920 R^2.
1.34–30	3,450 R^2/f^2.
30–300	3.83 R^2.
300–1,500	0.0128 R^2f.
1,500–100,000	19.2R^2.

According to §1.1307(b)(3)(ii), For multiple RF sources: Multiple RF sources are exempt if:

(A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those is paragraph (b)(3)(i)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(i)(A).

(B) in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^{a}\frac{P_i}{P_{th,i}}+\sum_{j=1}^{b}\frac{ERP_j}{ERP_{th,j}}+\sum_{k=1}^{c}\frac{Evaluated_k}{Exposure\ Limit_k}\leq 1$$

2.2 Result

Single RF source:

Option C:

Radio	Frequency (MHz)	Distance (mm)	Exemption ERP (mW)	Maximum Conducted Power including Tune-up Tolerance (dBm)	Antenna Gain (dBi)	ERP		Result Option C
						dBm	mW	
BT	2402-2480	200	768	7.5	2.47	7.82	6.05	exempt
2.4G WLAN	2412-2472	200	768	12.0	4.23	14.08	25.59	exempt
5.2G WLAN	5180-5240	200	768	13.5	5.10	16.45	44.16	exempt
5.8G WLAN	5745-5825	200	768	21.0	5.10	23.95	248.31	exempt

Note: The Maximum Conducted Power including Tune-up Tolerance was declared by manufacturer.

Multiple RF sources transmission simultaneously consider:

According to applicant, the BT and WLAN can transmission simultaneously.

The ratio=6.05/768+248.31/768=0.331<1.0

Result: Complied

---End of Report---