

RF Exposure Evaluation Report

Product : Handheld Auto Refractometer
Trade mark : MOPTIM
Model/Type reference : easyRef Pro, R2X, R3X
Serial Number : N/A
Report Number : EED32Q81175902
FCC ID : 2A422EASYREFPRO
Date of Issue : Sep. 03, 2024
Test Standards : 47 CFR Part 1.1307
47 CFR Part 1.1310
47 CFR Part 2.1091
47 CFR Part 2.1093
KDB 447498 D04 Interim General RF Exposure Guidance v01
Test result : PASS

Prepared for:

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Sep. 03, 2024



Check No.: 9253070824

1 Version

Version No.	Date	Description
00	Sep. 03, 2024	Original

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3 General Information

3.1 Client Information

Applicant:	Shenzhen CERTAINN Technology Co., Ltd.
Address of Applicant:	L302, Bldg.2, No.8 Tangtou 1st Road, Shenzhen, Guangdong, 518108, China
Manufacturer:	Shenzhen CERTAINN Technology Co., Ltd.
Address of Manufacturer:	L302, Bldg.2, No.8 Tangtou 1st Road, Shenzhen, Guangdong, 518108, China
Factory:	Shenzhen CERTAINN Technology Co., Ltd.
Address of Factory:	L302, Bldg.2, No.8 Tangtou 1st Road, Shenzhen, Guangdong, 518108, China

3.2 General Description of EUT

Product Name:	Handheld Auto Refractometer
Model No.:	easyRef Pro, R2X, R3X
Test Model No.:	easyRef Pro
Trade mark:	MOPTIM

3.3 Product Specification subjective to this standard

Frequency Range:	2402MHz~2480MHz	
Modulation Type:	GFSK	
Test Power Grade:	Default	
Test Software:	CMD.exe (manufacturer declare)	
Antenna Type:	FPC Antenna	
Antenna Gain:	3.27dBi	
Power Supply:	Battery:	DC 5V
Sample Received Date:	Aug. 15, 2024	
Sample tested Date:	Aug. 15, 2024 to Aug. 28, 2024	

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.: easyRef Pro, R2X, R3X
Only the model easyRef Pro was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, only the model name and spherical power range are different for marketing requirements.

Model	Spherical power range
easyRef Pro	-25.0D~+25.0D
R3X	-20.0D~+20.0D
R2X	-20.0D~+15.0D

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 Limits

The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold P_{th} (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by Formula

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

where

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

and f is in GHz, d is the separation distance (cm), and $ERP_{20 \text{ cm}}$ is per Formula (B.1).

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$

The 1 mW Blanket Exemption of § 1.1307(b)(3)(i)(A) applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power of no more than 1 mW, regardless of separation distance.

4.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

4.1.3 EUT RF Exposure Evaluation**For Stand alone:****For Bluetooth LE:**

Frequency (MHz)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	ERP (dBm)	ERP (mW)	Limit (mW)	Result
2440	2.85	3.27	6.12	3.97	2.4946	2.753	PASS

Note:

① EIRP=conducted power+antenna gain;

② ERP=EIRP-2.15;

③ EIRP(dBm) = Field strength of the fundamental signal(dBuV/m@3m) – 95.23;

④ ERP(mW) = $10^{(ERP \text{ (dBm)}/10)}$;

⑤ The estimation distance is 0.5cm;

⑥ The test data please refer to the report of EED32Q81175901 and only the worst case data was recorded in the report.

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 *****