

RF Exposure Evaluation Report

Product : LUMITool F20
Trade mark : LUMITool
Model/Type reference : F20
Serial Number : N/A
Report Number : EED32Q80845702
FCC ID : 2BKJ5LUMIToolF20
Date of Issue : Sep. 10, 2024
Test Standards : 47 CFR Part 1.1307
47 CFR Part 1.1310
47 CFR Part 2.1091
47 CFR Part 2.1093
447498 D04 Interim General RF
Exposure Guidance v01
Test result : PASS

Prepared for:

Shenzhen Earain Automation Equipment Co., Ltd.
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Guangming District, Shenzhen

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1 Version

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3 General Information

3.1 Client Information

Applicant:	Shenzhen Earain Automation Equipment Co., Ltd.
Address of Applicant:	902, Building 4, Taiyun Chuanggu, Guangming Avenue South, Guangming District, Shenzhen
Manufacturer:	Shenzhen Earain Automation Equipment Co., Ltd.
Address of Manufacturer:	902, Building 4, Taiyun Chuanggu, Guangming Avenue South, Guangming District, Shenzhen
Factory:	Shenzhen Earain Automation Equipment Co., Ltd.
Address of Factory:	902, Building 4, Taiyun Chuanggu, Guangming Avenue South, Guangming District, Shenzhen

3.2 General Description of EUT

Product Name:	LUMITOOL F20
Model No.(EUT):	F20
Trade Mark:	LUMITOOL

3.3 Product Specification subjective to this standard

Frequency Range:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz	
Modulation Type:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g :OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20) : OFDM (64QAM, 16QAM,QPSK,BPSK)	
Test Power Grade:	Default	
Test Software of EUT:	EspRFTestTool_v3.6_Manual	
Antenna Type:	PCB Antenna	
Antenna Gain:	1.97dBi	
Power Supply:	Adapter:	Model: BSG-12020000 Input: 100-240V~, 3.0A Output: 12.0V $\Rightarrow$ 20.0A
Sample Received Date:	Aug. 13, 2024	
Sample tested Date:	Aug. 13, 2024 to Aug. 22, 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.	

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 Pth (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). Pth 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 ERP20cm 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 2.4G Wi-Fi**

Frequency (MHz)	Max. Conducted Output power (dBm)	Antenna Gain (dBi)	EIRP (dBm)	ERP (dBm)	ERP (mW)	Limit (mW)	Result
2412	12.51	1.97	14.48	12.33	17.100	≤3060	PASS

Note:

- ① EIRP=conducted power+antenna gain;
- ② ERP=EIRP-2.15;
- ③ $\text{EIRP(dBm)} = \text{Field strength of the fundamental signal(dBuV/m@3m)} - 95.23$;
- ④ $\text{ERP(mW)} = 10^{(\text{ERP (dBm)}/10)}$;
- ⑤ The estimation distance is 20cm;
- ⑥ The test data please refer to the report of EED32Q80845701 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 ***