

1 Cover Page

RF Exposure Evaluation Report

Application No.: SHCR2202000375HS
Applicant: Lumi United Technology Co., Ltd.
Address of Applicant: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China
Manufacturer: Lumi United Technology Co., Ltd.
Address of Manufacturer: Room 801-804, Building 1, Chongwen Park, Nanshan iPark, No. 3370, Liuxian Avenue, Fuguang Community, Taoyuan Residential District, Nanshan District, Shenzhen, China
Factory: Siterwell Electronics Co., Limited
Address of Factory: No.666 Qingfeng Road, Jiangbei District, Ningbo, 315034, Zhejiang Province, China
Equipment Under Test (EUT):
EUT Name: Smart Radiator Thermostat E1
Model No.: SRTS-A01
Trade Mark: Aqara
Standard(s) : EN IEC 62311: 2020
Date of Receipt: 2022-02-25
Date of Test: 2022-03-24 to 2022-03-24
Date of Issue: 2022-04-02

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Parlan Zhan

Parlan Zhan
Laboratory Manager



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Revision Record			
Version	Description	Date	Remark
00	Original	2022-04-02	/

Authorized for issue by:			
		<i>Wade Zhang</i>	
		Wade Zhang / Project Engineer	
		<i>Parlam Zhan</i>	
		Parlam Zhan / Reviewer	



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3 General Information

3.1 General Description of E.U.T.

Power supply:	DC 3V
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3.2 Details of E.U.T.

Operation Frequency:	2405-2480MHz
Modulation Type:	O-QPSK
Channel Spacing:	5MHz
Number of Channels:	16
Antenna Type:	PCB Antenna
Adaptive Type:	LBE under LBT based DAA
Antenna Gain:	0 dBi (Provided by manufacturer)
Receiver Category:	1



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3.3 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

No tests were sub-contracted.

3.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 6332.01)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA).

- **FCC (Designation Number: CN1301)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

- **ISED (CAB Identifier: CN0020)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

Company Number: 8617A

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

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4 Test Standards and Limits

The evaluation has been performed on the EUT, pursuant to the relevant requirements of the following document(s) and the harmonized EN standard(s) covering essential requirements under article 3.1 of the RED Directive (2014/53/EU).

Identity	Document Title	Version
Council Recommendation of 12 July 1999(1999/519/EC)	On the limitation of exposure of the general public to electromagnetic fields (0Hz to 300GHz)	1999
EN IEC 62311	Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz – 300 GHz)	2020

Limit: According to EN IEC 62311, the criteria listed in the below table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified table 2 of Council Recommendation 1999/519/EC.

Table 2
Reference levels for electric, magnetic and electromagnetic fields
(0 Hz to 300 GHz, unperturbed rms values)

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (µT)	Equivalent plane wave power density S_{eq} (W/m ²)
0-1 Hz	—	$3,2 \times 10^4$	4×10^4	—
1-8 Hz	10 000	$3,2 \times 10^4/f^2$	$4 \times 10^4/f^2$	—
8-25 Hz	10 000	$4 000/f$	$5 000/f$	—
0,025-0,8 kHz	$250/f$	$4/f$	$5/f$	—
0,8-3 kHz	$250/f$	5	6,25	—
3-150 kHz	87	5	6,25	—
0,15-1 MHz	87	$0,73/f$	$0,92/f$	—
1-10 MHz	$87/f^{1/2}$	$0,73/f$	$0,92/f$	—
10-400 MHz	28	0,073	0,092	2
400-2 000 MHz	$1,375 f^{1/2}$	$0,0037 f^{1/2}$	$0,0046 f^{1/2}$	$f/200$
2-300 GHz	61	0,16	0,20	10

Notes:

- f as indicated in the frequency range column.
- For frequencies between 100 kHz and 10 GHz, S_{eq} , E^2 , H^2 , and B^2 are to be averaged over any six-minute period.
- For frequencies exceeding 10 GHz, S_{eq} , E^2 , H^2 , and B^2 are to be averaged over any $68/f^{1.05}$ -minute period (f in GHz).
- No E-field value is provided for frequencies < 1 Hz, which are effectively static electric fields. For most people the annoying perception of surface electric charges will not occur at field strengths less than 25 kV/m. Spark discharges causing stress or annoyance should be avoided.

Note: The limit of power density is 10W/m².



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5 Calculation Formula and Test Result

5.1 Calculation Formula

$$Pd = (Pout * G) / 4\pi R^2$$

Where:

Pd = Power density in W/m²

Pout = Output power to antenna in W

G = Antenna Gain in linear scale

π = 3.14

R = distance to the center of radiation of antenna (in meter) = 0.2m

NOTE: Pd limit = 10W/m².

5.2 Test Results

The EIRP Data is based on the RF Test Report SHCR220200037503.

For Wi-Fi:

The max EIRP is PG =	7.89	dBm =	0.0062	W;
So, S = $\frac{PG}{4R^2\pi}$	= 0.01	W/m ²		

Which is below the max permitted sending level of 10W/m², and then the EUT is not need to conduct SAR measurement.

--The End of Report--



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