Test Report

Verified code: 088326

Report No.: E202110111758-3-G1

Customer:	Wifx Sarl
Address:	Avenue des Sciences 2, 1400 Yverdon-les-Bains, Switzerland
Sample Name:	Wifx L1
Sample Model:	Wifx L1
Receive Sample Date:	Nov.12,2021
Test Date:	Nov.13,2021 ~ Apr.27,2022
Reference Document:	CFR 47, FCC Part 2.1091 Radio frequency radiation exposure evaluation: mobile devices
Test Result:	Pass

Prepared by: Reviewed by: Approved by:

GUANGZHOU GRG METROLOGY & TEST CO., LTD

Issued Date: 2022-07-12

GUANGZHOU GRG METROLOGY & TEST CO., LTD.
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Statement

1. The report is invalid without "special seal for inspection and testing"; some copies are invalid; The report is invalid if it is altered or missing; The report is invalid without the signature of the person who prepared, reviewed and approved it.

2. The sample information is provided by the client and responsible for its authenticity; The content of the report is only valid for the samples sent this time.

3. When there are reports in both Chinese and English, the Chinese version will prevail when the language problems are inconsistent.

4. If there is any objection concerning the report, please inform us within 15 days from the date of receiving the report.

5. Without the agreement of the laboratory, the client is not authorized to use the test results for unapproved propaganda.

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REPORT ISSUED HISTORY

Report Version	Report No.	Description	Compile Date
1.0	E202110111758-3	Original Issue	2022/05/18
2.0	E202110111758-3-G1	Update	2022/07/11

Version 2.0:

1. Update antenna specification: External antenna with SMA connector, 5dBi(Max) to External antenna with N connector, 5dBi (Max).
2. This report instead the report E202110111758-3, and from the date of issuance of this report, the report which being replaced become invalid.

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1. GENERAL DESCRIPTION OF EUT

1.1 APPLICANT

Name:	Wifx Sarl
Address:	Avenue des Sciences 2, 1400 Yverdon-les-Bains, Switzerland

1.2 MANUFACTURER

Name :	Wifx Sarl
Address:	Avenue des Sciences 2, 1400 Yverdon-les-Bains, Switzerland

1.3 FACTORY

Name:	Gugler Elektronik AG
Address:	Rte de Chesalles 62, 1723 Marly 1, Switzerland

1.4 BASIC DESCRIPTION OF EQUIPMENT UNDER TEST

Equipment:	Wifx L1
Model No.:	Wifx L1
Adding Model:	/
Trade Name:	Wifx
Power supply:	Input: DC 10V-48V 800mA-170mA (800mA max for DC 10V input, 350mA max for DC 24V input, 170mA for DC 48V input)
Adapter:	Model:HNP 121-240L6 Input:100-240V~50/60Hz 0.45A, Output:24.0V ⎓0.5A 12.0W
Frequency Range:	923.3 ~ 927.5MHz
Modulation type:	LoRa
Antenna Specification:	External antenna with N connector, 5dBi (Max)
Temperature Range:	-30℃ ~ +70℃
Hardware Version:	1.0
Software Version:	1.4.0-certification.3
Sample No:	E202110111758-0001
Note:	The USB type-C connection should be used exclusively for service administration /configuration and should not be left connected during normal use.

2. LABORATORY AND ACCREDITATIONS

2.1 LABORATORY

The tests & measurements refer to this report were performed by Shenzhen EMC Laboratory of Guangzhou GRG Metrology & Test Co., Ltd.

Add.:	No.1301 Guanguang Road Xinlan Community, Guanlan Street, Longhua District Shenzhen, 518110, People's Republic of China.
P.C.:	518110
Tel :	0755-61180008
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2.2 ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	A2LA(Certificate #2861.01)

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	ISED (Company Number: 24897，CAB identifier:CN0069)
USA	FCC (Registration Number: 759402，Designation Number:CN1198)

Copies of granted accreditation certificates are available for downloading from our web site, http://www.grgtest.com

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3. EVALUATION METHOD

Exposure category: General population/uncontrolled environment
EUT Type: Production Unit
Device Type: Mobile equipment

Systems operating under the provisions of FCC 47 CFR section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.
In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as mobile device whereby a distance of 0.2m normally can be maintained between the user and the device, and below RF Permissible Exposure limit shall comply with.
In accordance with KDB447498D01 for Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0. The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency. Either the maximum peak or spatially averaged results from measurements or numerical simulations may be used to determine the MPE ratios. Spatial averaging does not apply when MPE is estimated using simple calculations based on far-field plane-wave equivalent conditions. The antenna installation and operating requirements for the host device must meet the minimum test separation distances required by all antennas, in both standalone and simultaneous transmission operations, to satisfy compliance.

4. LIMITS FOR GENERAL POPULATION/UNCONTROLLEDEXPOSURE

(B)Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength(H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time$[E]^2$, $[H]^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-100,000	/	/	1.0	30

Note: f=frequency in MHz; *Plane-wave equivalent power density

5. CALCULATION METHOD

Predication of MPE limit at a given distance
Equation from page 18 of OET Bulletin 65, Edition 97-01
$S=PG/4\pi R^2$
Where: S=power density
P=power input to antenna
G=power gain of the antenna in the direction of interest relative to anisotropic radiator
R=distance to the center of radiation of the antenna
From the EUT RF output power, the minimum mobile separation distance, d=0.2m, as well as the maximum gain of the used as following information, the RF power density can be obtained.

Frequency Band	Antenna type	Maximum antenna gain
923.3 ~ 927.5MHz	External antenna with N connector	5dBi

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6. ESTIMATION RESULT

6.1 CONDUCTED POWER RESULTS

Frequency(MHz)	Conducted Output Power (dBm) (Average)
923.3	24.518
927.5	24.129

6.2 MANUFACTURING TOLERANCE

Frequency (MHz)	923.3	927.5
Target (dBm)	24.0	24.0
Tolerance ±(dB)	1.0	1.0

6.3 MEASUREMENT RESULTS

Frequency (MHz)	Output power		Antenna Gain (dBi)	Antenna Gain (linear)	MPE (mW/cm^2)	MPE Limits (mW/cm^2)
	(dBm)	(mW)				
923.3	25.0	316.23	5	3.16	0.1990	0.6155
927.5	25.0	316.23	5	3.16	0.1990	0.6183

Note:
MPE Limits(923.3MHz)=F(MHz)/1500=923.3/1500=0.6155 mW/cm^2
MPE Limits(927.5MHz)=F(MHz)/1500=927.5/1500=0.6183 mW/cm^2
S(923.3MHz)=PG/4πR²= 316.23*3.16/4/3.14/400 = 0.1990 mW/cm^2
S(927.5MHz)=PG/4πR²= 316.23*3.16/4/3.14/400 = 0.1990 mW/cm^2

Remark: 1. Maximum average power including tune-up tolerance;
2. MPE use distance is 20cm from manufacturer declaration of user manual.

6.4 CONCLUSION

The measurement results comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile equipment.

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