

FCC Test Report

Report No.: AGC14659221119FE01

PRODUCT DESIGNATION: Respiray Wear A+

BRAND NAME : Respiray

MODEL NAME : RSWA01, RSWA

APPLICANT : OÜ Respiray

DATE OF ISSUE : Nov. 25, 2022

STANDARD(S) : FCC Part 15 Subpart B

REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd



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REPORT REVISE RECORD

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	Nov. 25, 2022	Valid	Initial release

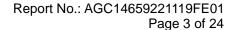
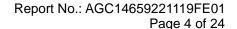




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1 VERIFICATION OF CONFORMITY

Applicant	OÜ Respiray
Address	3rd Floor, Mõisa 4, Tallinn, Estonia, 13522
Manufacturer	OÜ Respiray
Address	3rd Floor, Mõisa 4, Tallinn, Estonia, 13522
Factory	OÜ Respiray
Address	3rd Floor, Mõisa 4, Tallinn, Estonia, 13522
Product Designation	Respiray Wear A+
Brand Name	Respiray
Test Model	RSWA01
Series Model	RSWA
Difference Description	All the same except for the model name.
Date of receipt of test item	Nov. 22, 2022
Date of test	Nov. 22, 2022 to Nov. 25, 2022
Deviation	No deviation from the test method.
Condition of Test Sample	Normal
Test Result	Pass

The above equipment was tested by Attestation of Global Compliance (Shenzhen) Co., Ltd. for compliance with the requirements set forth in the FCC Rules and Regulations Part 15, the measurement procedure according to ANSI C63.4:2014. This said equipment in the configuration described in this report shows the maximum emission levels emanating from equipment are within the compliance requirements. The test results of this report relate only to the tested sample identified in this report.

Prepared By

Jack Gui
(Project Engineer)

Reviewed By

Calvin Liu
(Reviewer)

Nov. 25, 2022

Approved By

Forrest Lei
(Authorized Officer)

Nov. 25, 2022



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2 SYSTEM DESCRIPTION

TEST MODE DESCRIPTION					
NO.	TEST MODE DESCRIPTION	WORST			
1	Device turned on, ventilators working	V			
Note: 1. V m	Note: 1. V means EMI worst mode.				

3 MEASUREMENT UNCERTAINTY

The uncertainty is calculated using the methods suggested in the "Guide to the Expression of Uncertainty in measurement" (GUM) published by ISO.

- Uncertainty of Conducted Emission, Uc = ±2.9dB
- Uncertainty of Radiated Emission, Uc = ±3.8 dB



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4 PRODUCT INFORMATION

Housing Type	Plastic
EUT Input Rating	DC 5.0V by adapter or DC 3.7V by battery
Hardware Version	N/A
Software Version	N/A

I/O Port Information (⊠Applicable □Not Applicable)

I/O Port of EUT					
I/O Port Type	Number	Cable Description	Tested With		
Type-C	1		1		



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5 SUPPORT EQUIPMENT

Device Type	Manufacturer	Model Name	Serial No.	Data Cable	Power Cable
Adapter	HUAWEI	HW-200325CP0			0.8m unshielded

Note: All the above equipment/cables were placed in worse case positions to maximize emission signals during emission test.



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6 TEST FACILITY

Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location	1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

7 TEST EQUIPMENT LIST

TEST EQUIPMENT OF CONDUCTED EMISSION TEST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Test Receiver	R&S	ESPI	101206	Mar. 28, 2022	Mar. 27, 2023
Artificial power network	R&S	ESH2-Z5	100086	Jun. 08, 2022	Jun. 07, 2023
Test Software	R&S	ES-K1	Ver.V1.7.1	N/A	N/A

TEST EQUIPMENT OF RADIATED EMISSION TEST

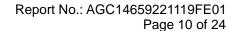
Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Due
Test Receiver	R&S	ESCI	10096	Mar. 28, 2022	Mar. 27, 2023
Antenna	SCHWARZBECK	VULB9168	494	Jan. 08, 2021	Jan. 07, 2023
Test software	FARA	EZ-EMC	Ver.RA-03A	N/A	N/A



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8 TEST SUMMARY LIST

Test item	Test Requirement	Test Method	Class/Severity	Result
Conducted Emission	FCC Part 15 Subpart B	ANSI C63.4	Class B	Pass
Radiated Emission	FCC Part 15 Subpart B	ANSI C63.4	Class B	Pass





9. LINE CONDUCTED EMISSION TEST

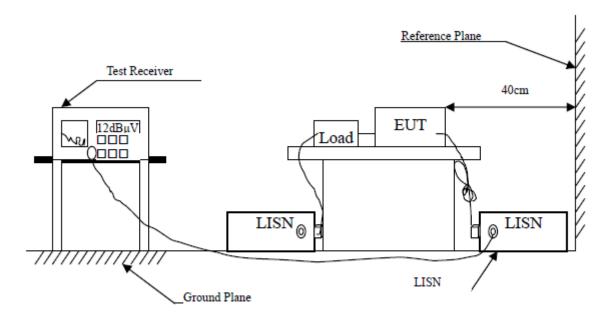
9.1. LIMITS OF LINE CONDUCTED EMISSION TEST

Francis	Maximum R	F Line Voltage
Frequency	Q.P.(dBuV)	Average(dBuV)
150kHz-500kHz	66-56	56-46
500kHz-5MHz	56	46
5MHz-30MHz	60	50

Note: 1. The lower limit shall apply at the transition frequency.

2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50MHz.

9.2. BLOCK DIAGRAM OF TEST SETUP





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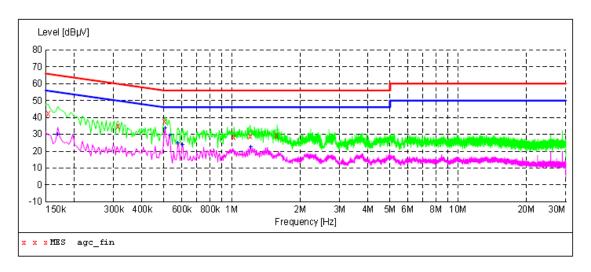
9.3. PROCEDURE OF LINE CONDUCTED EMISSION TEST

- (1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- (2) Support equipment, if needed, was placed as per ANSI C63.4.
- (3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- (4) The EUT received DC 5V power from adapter which received AC120V/60Hz power from a LISN.
- (5) The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- (6) Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- (7) During the above scans, the emissions were maximized by cable manipulation.
- (8) A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions.
- (9) Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less –2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.



9.4. TEST RESULT OF LINE CONDUCTED EMISSION TEST

LINE CONDUCTED EMISSION TEST-L



MEASUREMENT RESULT: "agc_fin"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.154000	42.40	6.9	66	23.4	QP	L1
0.314000	34.70	6.0	60	25.2	QP	L1
0.506000	37.70	5.4	56	18.3	QP	L1
1.022000	28.50	5.5	56	27.5	QP	L1
1.202000	28.70	5.7	56	27.3	QP	L1
1.586000	29.50	6.1	56	26.5	QP	L1

MEASUREMENT RESULT: "agc fin2"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.170000	29.70	6.8	55	25.3	AV	L1
0.506000	33.30	5.4	46	12.7	AV	L1
0.530000	29.30	5.4	46	16.7	AV	L1
0.578000	24.70	5.4	46	21.3	AV	L1
0.606000	23.70	5.4	46	22.3	AV	L1
1.206000	22.10	5.7	46	23.9	AV	L1

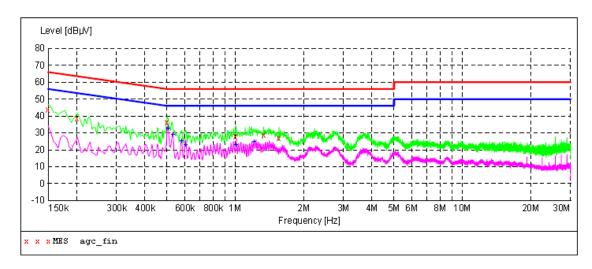
RESULT: PASS

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LINE CONDUCTED EMISSION TEST-N



MEASUREMENT RESULT: "agc_fin"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.150000	43.90	6.9	66	22.1	QP	N
0.202000	38.70	6.5	64	24.8	QP	N
0.502000	36.20	5.4	56	19.8	QP	N
1.006000	28.00	5.4	56	28.0	QP	N
1.334000	28.80	5.9	56	27.2	QP	N
1.558000	27.20	6.1	56	28.8	QP	N

MEASUREMENT RESULT: "agc fin2"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.506000	32.40	5.4	46	13.6	AV	N
0.530000	28.60	5.4	46	17.4	AV	N
0.582000	25.10	5.4	46	20.9	AV	N
0.602000	22.80	5.4	46	23.2	AV	N
1.010000	22.80	5.4	46	23.2	AV	N
1.210000	24.40	5.7	46	21.6	AV	N

RESULT: PASS

Note:

Measurement Level(dBuV) = Receiver reading(dBuV)+Tansd(dB)
Transd(dB)=AMN Factor(dB)+Cable Loss(dB)+Attenuation(dB) for Attenuator
Margin= Limit-Level



10 FCC RADIATED EMISSION TEST

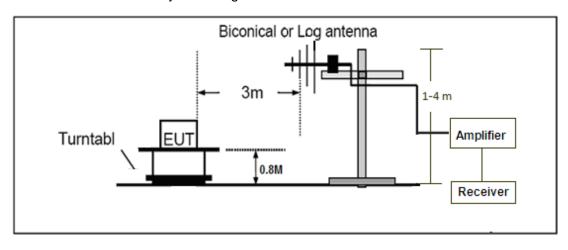
10.1 LIMITS OF RADIATED EMISSION TEST

Frequency (MHz)	Distance (m)	Maximum Field Strength Limit (dBuV/m/ Q.P.)
30~88	3	40.0
88~216	3	43.5
216~960	3	46.0
Above 960	3	54.0

Note: The lower limit shall apply at the transition frequency.

10.2 BLOCK DIAGRAM OF TEST SETUP

System Diagram of Connections between EUT and Simulators





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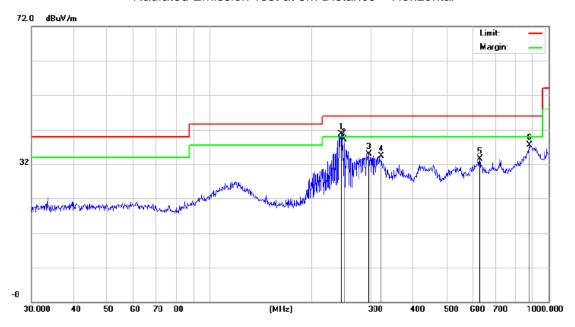
10.3 PROCEDURE OF RADIATED EMISSION TEST

- (1) The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- (2) Support equipment, if needed, was placed as per ANSI C63.4.
- (3) All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- (4) The EUT was turned on.
- (5) The antenna was placed at 3 meter away from the EUT as stated in FCC Part 15. The antenna connected to the Analyzer via a cable and at times a pre-amplifier would be used.
- (6) The Analyzer / Receiver quickly scanned from 30MHz to 1000MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- (7) The test mode(s) were scanned during the test:
- (8) Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and Q.P./Peak reading is presented.



10.4 TEST RESULT OF RADIATED EMISSION TEST

Radiated Emission Test at 3m Distance - Horizontal

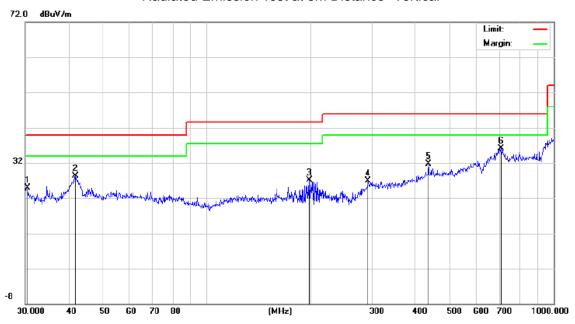


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dΒ	Detector
1	* 2	245.0900	18.67	21.99	40.66	46.00	-5.34	peak
2	2	249.4250	17.47	21.65	39.12	46.00	-6.88	peak
3	2	296.1836	10.57	24.39	34.96	46.00	-11.04	peak
4	3	321.0607	8.01	26.32	34.33	46.00	-11.67	peak
5	6	327.2738	7.00	26.51	33.51	46.00	-12.49	peak
6	8	378.3214	5.55	32.03	37.58	46.00	-8.42	peak

RESULT: PASS



Radiated Emission Test at 3m Distance -Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB	dBuV/m	dB/m	dΒ	Detector
1		30.5306	9.19	15.67	24.86	40.00	-15.14	peak
2		41.8596	11.31	16.92	28.23	40.00	-11.77	peak
3		197.8928	12.12	15.07	27.19	43.50	-16.31	peak
4		292.0583	6.93	19.91	26.84	46.00	-19.16	peak
5		435.5898	7.85	23.84	31.69	46.00	-14.31	peak
6	*	704.2261	6.22	29.83	36.05	46.00	-9.95	peak

RESULT: PASS

Note:

Level(dBuV/m)=Reading(dBuV)+Factor(dB/m)

Factor(dB/m)=Antenna Factor(dB/m)+Cable loss(dB)+Attenuation(dB)for Attenuator

Over= Measurement- Limit



APPENDIX A: PHOTOGRAPHS OF TEST SETUP

FCC LINE CONDUCTED EMISSION TEST SETUP



FCC RADIATED EMISSION TEST SETUP



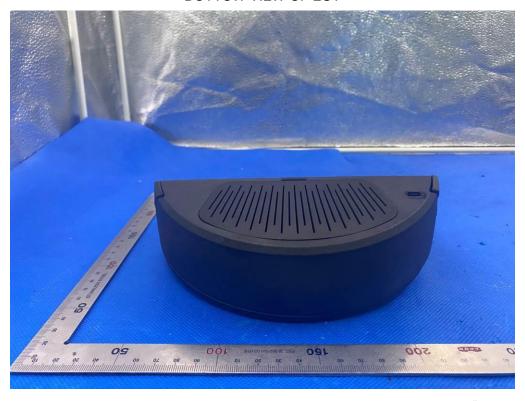


APPENDIX B: PHOTOGRAPHS OF EUT

TOP VIEW OF EUT

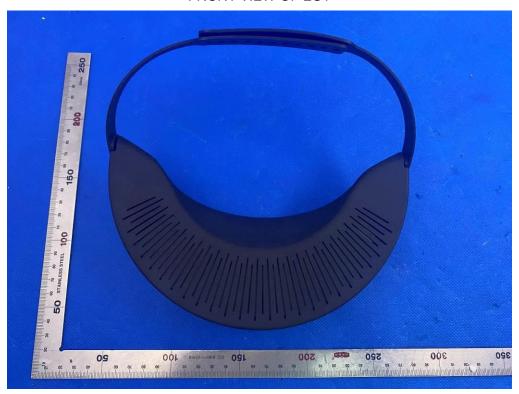


BOTTOW VIEW OF EUT





FRONT VIEW OF EUT



BACK VIEW OF EUT





LEFT VIEW OF EUT



RIGHT VIEW OF EUT





OPEN VIEW OF EUT-1



OPEN VIEW OF EUT-2

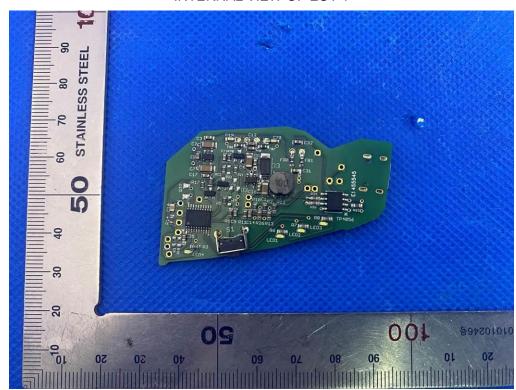


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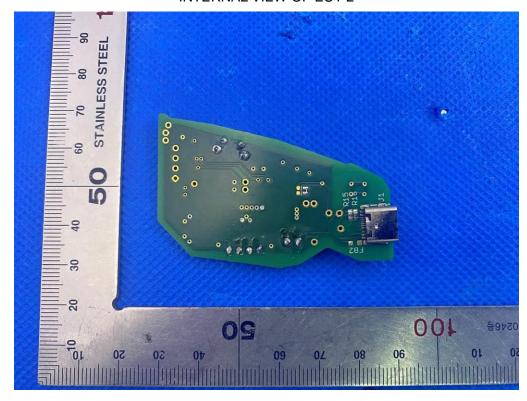
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INTERNAL VIEW OF EUT-1

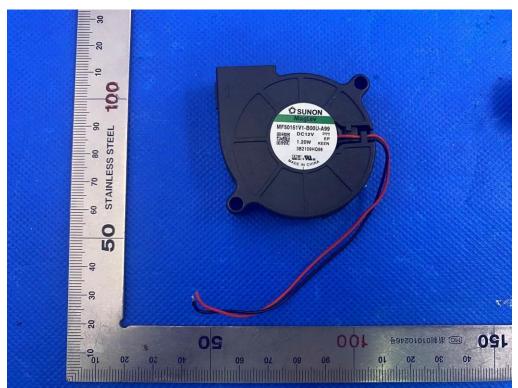


INTERNAL VIEW OF EUT-2

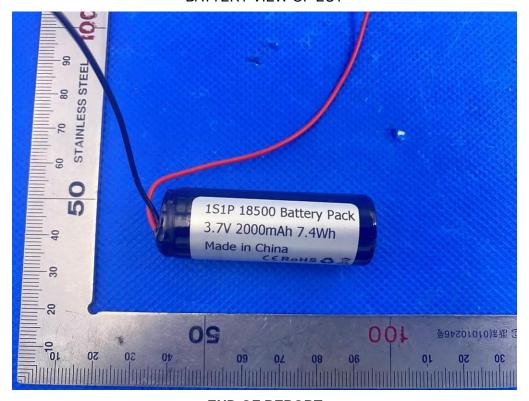




INTERNAL VIEW OF EUT-3



BATTERY VIEW OF EUT



----END OF REPORT----



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- 1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd. (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the "Clients").
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- 3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
- 4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
- 5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
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- 8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
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