



Radio Frequency Exposure Evaluation Report

For:

Uhnder Inc.

Model Name:

UR-AS2120

Product Description:

4D Digital Imaging Radar Sensor

FCC ID: 2AXF3-URAS2120

ISED: 26449-URAS2120

Applied Rules and Standards:

CFR Part 1 (1.1307 & 1.1310), Part 2 (2.1091)

ISED RSS-102 Issue 5

Report number: EMC_UHNDE_010_22001_MPE_Rev1

DATE: 12-15-2022



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1. Assessment

This RF Exposure evaluation report provides information about compliance of the below identified device with the RF Exposure limits for mobile devices as defined in FCC CFR Part 1 (1.1307 & 1.1310), Part 2 (2.1091), and ISED standard RSS-102, under given conditions (measured or rated RF output power, antenna gain, distance towards human body, multiple transmitter information as presented by the applicant). In addition, maximum antenna gain or minimum distance towards the human body is calculated, respectively, where relevant.

The device meets the limits as stipulated by the above given FCC/ISED rule parts based on available specifications.

Company Name	Product Description	Model #
Uhnder Inc.	4D Digital Imaging Radar Sensor	UR-AS2120

Responsible for Testing Laboratory:

Arndt Stoecker			
12-15-2022	Compliance	(Director of Regulatory Services)	
Date	Section	Name	Signature

Responsible for the Report:

Kris Lazarov			
12-15-2022	Compliance	(Senior EMC Engineer)	
Date	Section	Name	Signature

The test results of this test report relate exclusively to the test item specified in Section 3.
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2. Administrative Data

2.1. Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
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Country	USA
Telephone / Fax	+1 (408) 586 6200 / +1 (408) 586 6299
Director of Regulatory Services:	Arndt Stoecker
Responsible Project Leader:	Akanksha Baskaran

2.2. Identification of the Client

Client's Name:	Uhnder Inc.
Street Address:	3409 Executive Center Drive Suite 205
City/Zip Code	Austin TX
Country	US

2.3. Identification of the Manufacturer

Manufacturer's Name:	Same as Client
Manufacturers Address:	
City/Zip Code	
Country	

3. Equipment under Assessment

Model No	UR-AS2120
HW Version	P2
SW Version	SRS 0.81.3
Frequency Range:	Nominal band: 76 GHz – 81 GHz
Modulation Characteristics:	PMCW
Modes of Operation:	Single Mode – Continuous transmit
Declared Antenna Gain:	15.6 dBi
Declared EIRP	37 dBm + 2 dBm tune up
Co-located Transmitters/ Antennas?	None
Power Supply/ Rated Operating Voltage Range	Vmin: 10V/ Vnom: 12V / Vmax: 16V
Operating Temperature Range	From: -10 C to +75 C, > 0.8 m/s air flow
Sample Revision	<input type="checkbox"/> Prototype <input type="checkbox"/> Production <input checked="" type="checkbox"/> Pre-Production
Device Category	<input type="checkbox"/> Fixed Installation <input checked="" type="checkbox"/> Mobile <input type="checkbox"/> Portable
Exposure Category	<input type="checkbox"/> Occupational/ Controlled <input checked="" type="checkbox"/> General Population/ Uncontrolled

4. RF Exposure Limits and FCC and ISED

4.1. FCC § 2.1091 Radiofrequency radiation exposure evaluation: mobile devices.

Single RF sources as defined in paragraph (b)(2) of FCC § 2.1091 is exempt if the ERP (watts) is no more than the calculated value prescribed for that frequency. General frequency and separation-distance dependent MPE-based effective radiated power ERP thresholds are in Table B.1 [Table 1 of § 1.1307(b)(3)(i)(C)].

TABLE B.1—THRESHOLDS FOR SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

RF Source Frequency			Minimum Distance			Threshold ERP
f_L MHz		f_H MHz	$\lambda_L / 2\pi$		$\lambda_H / 2\pi$	W
0.3	–	1.34	159 m	–	35.6 m	$1,920 R^2$
1.34	–	30	35.6 m	–	1.6 m	$3,450 R^2/f^2$
30	–	300	1.6 m	–	159 mm	$3.83 R^2$
300	–	1,500	159 mm	–	31.8 mm	$0.0128 R^2f$
1,500	–	100,000	31.8 mm	–	0.5 mm	$19.2 R^2$
Subscripts L and H are low and high; λ is wavelength. From § 1.1307(b)(3)(i)(C), modified by adding Minimum Distance columns.						

4.2. RSS-102, cl. 2.5.2 Exemption Limits for Routine Evaluation:

- At or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

5. Evaluation

5.1. Routine Environmental Evaluation Applicability Standalone Transmission

The transmit duty cycle in this device is fixed by the software / firmware and cannot be controlled by the end user. For this routine evaluation the duty cycle was obtained from CETECOM report # EMC_UHNDE_010_22001_FCC_95M, and used to calculate the Time Averaged ERP.

Band of Operation (GHz)	ERP (W)	EIRP (W)	Maximum Duty Cycle %	Time AVG ERP (W)	FCC Threshold ERP (W)	Time AVG EIRP (W)	ISED Threshold EIRP (W)
76 - 81	4.84	7.95	7	0.34	0.77	0.56	5

Conclusion:

- The equipment fulfills the MPE exclusion limits for the minimum 20cm distance between the antenna and the human body in a standalone transmission evaluation for both FCC, and ISED.
- The device fulfills unwanted emissions requirements of FCC 47 § 95.3385 for any separation distance according to § 1.1307(b)(3)(i)(A)], because the level of highest measured unwanted emissions is $0.00048 \text{ mW} < 1 \text{ mW}$

6. Revision History

Date	Report Name	Changes to report	Prepared by
11-29-2022	EMC_UHNDE_010_22001_MPE	Initial Version	Kris Lazarov
12-15-2022	EMC_UHNDE_010_22001_MPE_Rev1	Updated the table in section 3; Added evaluation statement for unwanted emissions in section 5	Kris Lazarov

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