



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)

ISEDC RSS-102 Issue 5

Report number: EMC_UHNDE_010_22001_MPE_Rev1

DATE: 12-15-2022



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3462B-1

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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 ISEDC 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/ISEDC rule parts based on available specifications.

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

Responsible for Testing Laboratory:

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

Responsible for the Report:

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

The test results of this test report relate exclusively to the test item specified in Section3.

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2. Administrative Data

2.1. Identification of the Testing Laboratory Issuing the Test Report

Company Name:	CETECOM Inc.
Department:	Compliance
Street Address:	411 Dixon Landing Road
City/Zip Code	Milpitas, CA 95035
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
1.34	—	30	35.6 m	—	1.6 m
30	—	300	1.6 m	—	159 mm
300	—	1,500	159 mm	—	31.8 mm
1,500	—	100,000	31.8 mm	—	0.5 mm

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 mW < 1 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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