

Prüfbericht-Nr.: Test report no.:	60363426-002	Auftrags-Nr.: Order no.:	23870325 030	Seite 1 von 6 Page 1 of 6	
Kunden-Referenz-Nr.: Client reference no.:		Auftragsdatum: Order date:	2020.02.20		
Auftraggeber: Client:	Amazon Data Services, Inc.				
Prüfgegenstand: Test item:	IoT Device				
Bezeichnung / Typ-Nr.: Identification / Type no.:	FCC ID: 2AVPL-TE1A001 Model: TE1A001				
Auftrags-Inhalt: Order content:	RF Exposure Evaluation				
Prüfgrundlage: Test specification:	FCC 47 CFR 2.1091 IEEE Std. C95.1:2005				
Wareneingangsdatum: Date of sample receipt:	N/A				
Prüfmuster-Nr.: Test sample no.:	N/A				
Prüfzeitraum: Testing period:	N/A -				
Ort der Prüfung: Place of testing:	Lund, Sweden				
Prüflaboratorium: Testing laboratory:	TÜV Rheinland Sweden				
Prüfergebnis*: Test result*:	Siehe Sonstiges / See Other				
überprüft von: reviewed by:	genehmigt von: authorized by:				
Datum: 2020.07.14 Date:	Datum: 2020.07.14 Date:				
Stellung / Position:	Test Engineer	Stellung / Position:	Lab Manager		
Sonstiges / Other:	See details in report				
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:	Prüfmuster vollständig und unbeschädigt Test item complete and undamaged				
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	4 = ausreichend N/A = nicht anwendbar	5 = mangelhaft N/T = nicht getestet
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory F(ail) = failed a.m. test specification(s)	4 = sufficient N/A = not applicable	5 = poor N/T = not tested
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts.</i>					

Revision History60363426-00260363426-002

Revision	Date	Remarks	Author
001	2020-05-12	First release	Niall Forrester
002	2020.07.14	- Updated customer's contact info in page 3 - Added Swedac logo in page 1	Fariborz Abasi
Note: Latest revision report will replace all previous reports			
This report based on RF Exposure FCC 47CR 2-1091 IEEE C95 Template version 1.1			

Statement of Compliance

Evaluation was performed based on FCC 47 CFR 2.1091 and IEEE C95.1:2005, together with the "General Population / Uncontrolled" requirements set out in FCC 47 CFR 1.1310 Table 1 (B)

The calculations below show that the TE1A001 device is compliant with these requirements at a distance of 20cm for all supported wireless transmitter technologies

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1. GENERAL INFORMATION

1.1 Test Site

Test Facility:	TÜV Rheinland Sweden AB
Address:	Mobilvägen 10
	223 62 Lund
	Sweden
Swedac Registration Number:	10325
FCC Test Firm Registration Number:	517458
ISED Test Site Registration Number:	24753

1.2 Client Information

Company Name:	Amazon Data Services, Inc.
Address:	410 Terry Ave N, Seattle
	WA 98109, USA
Contact Person:	
Contact e-Mail / Telephone	gtpcrequests@amazon.com

2. PRODUCT INFORMATION

2.1 General Description

Model name:	TE1A001
Manufacturer:	Amazon Data Services, Inc.
Model number / Marketing name:	TE1A001
FCC ID:	2AVPL-TE1A001
Description:	IoT device
Ancillary Equipment:	N/A

2.2 Device Usage and Evaluation Distance

The device is a vibration/temperature sensor that will transmit sensor data via Bluetooth Low Energy to a gateway. It will be attached to motors, gearboxes or bearings in an industrial environment, both indoors and outdoors.

The device has been evaluated at a distance of 20cm

2.3 Wireless Technologies and Bands Supported by the EUT

Technology	Band	Frequency Range (Tx)	Evaluation Performed
Bluetooth Low Energy	2.4 GHz	2402 MHz – 2480 MHz	YES

2.4 Simultaneous Transmission Configurations

No simultaneous transmission capabilities are supported by the device

2.5 E.i.r.p. and Antenna Gain

Technology	Band	Max. e.i.r.p. (dBm)	Max. Time-Averaged e.i.r.p. (dBm)	Antenna Gain (dBi)
Bluetooth Low Energy	2.4 GHz	9.9	9.9	2.22

3. TEST METHODS

3.1 Test Standards

Testing was performed according to the following standards / references

Standard	Version	Description
47 CFR 2.1091	-	Radiofrequency radiation exposure evaluation: mobile devices.

3.2 Additional references

Standard	Version	Description
IEEE Std. C95.1	2005	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz

3.3 Limits

Extract from 47 CFR 1.1310 - Radiofrequency radiation exposure limits

Table 1B

Limits for Maximum Permissible Exposure (MPE)
(Limits for general Population / Uncontrolled Exposure)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
0.3 - 1.34	614	1.63	*100	30
1.34 - 30	824/f	2-19/f	*180/f ²	30
30 - 300	27.5	0.073	0.2	30
300 - 1500	-	-	f/1500	30
1500 - 10000	-	-	1.0	30

Notes:

1. f = frequency in MHz
2. * = Plane-wave equivalent power density

4. EVALUATION DETAILS

4.1 Power Density (S) at 20cm Distance for Each Band and Technology

The Power Density at 20cm separation distance has been calculated for each of the transmitter technologies supported by the device according to a re-arrangement of the Friis formula, as below:

$$S = \frac{e.i.r.p.}{4\pi * r^2}$$

Where:

- “S” is power density in mW/cm²
- e.i.r.p. is the maximum equivalent isotropic radiated power (incl. tolerances) in mW according to data from the manufacturer
- “r” is the separation distance (20 cm)

Technology	Band	Freq* (MHz)	e.i.r.p (dBm)	e.i.r.p. (mW)	r (cm)	S (mW/cm ²)	Limit ** (mW/cm ²)
Bluetooth Low Energy	2.4 GHz	2402	9.90	9.77	20	0.002	1.000

*The lowest frequency in each band has been chosen, to give the most conservative limit

**The limits listed are from FCC 47 CFR 1.1310 Table 1 (B): “Limits for General Population/Uncontrolled”

From 1500MHz to 100000MHz, the limit is 1.0 mW/cm²