RF Exposure Evaluation Declaration

FCC ID:	Q9DASIN0306
Applicant:	Hewlett Packard Enterprise
Product:	HPE Aruba User Experience Sensor
Model No.:	ASIN0306
Trademark:	Hewlett Packard Enterprise , HPE aruba networking
FCC Classification:	Digital Transmission System (DTS) Unlicensed National Information Infrastructure (NII) 15E 6GHz Low Power Dual Client (6CD)
FCC Rule Part(s):	FCC Part 2.1091
Result:	Complies
Evaluation Date:	2023-08-30

Reviewed By: Jame Yuan

Approved By: Robin Wu

ACCREDITED
TESTING LABORATORY
CERTIFICATE #3628.01

Revision History

Report No.	Version	Description	Issue Date	Note
2306RSU027-U8	V01	Initial Report	2023-09-22	Valid

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1. General Information

1.1. Applicant

Hewlett Packard Enterprise

6280 America Center Drive, San Jose CA 95002, United States

1.2. Manufacturer

Hewlett Packard Enterprise

6280 America Center Drive, San Jose CA 95002, United States

1.3. Testing Facility

☒	**Test Site – MRT Suzhou Laboratory**				
	Laboratory Location (Suzhou - Wuzhong) D8 Building, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China **Laboratory Location (Suzhou - SIP)** 4b Building, Liando U Valley, No.200 Xingpu Rd., Shengpu Town, Suzhou Industrial Park, China				
	Laboratory Accreditations				
	A2LA: 3628.01		CNAS: L10551		
	FCC: CN1166		ISED: CN0001		
	VCCI:	☐R-20025	☐G-20034	☐C-20020	☐T-20020
		☐R-20141	☐G-20134	☐C-20103	☐T-20104
☐	**Test Site – MRT Shenzhen Laboratory**				
	Laboratory Location (Shenzhen) 1G, Building A, Junxiangda Building, Zhongshanyuan Road West, Nanshan District, Shenzhen, China				
	Laboratory Accreditations				
	A2LA: 3628.02		CNAS: L10551		
	FCC: CN1284		ISED: CN0105		
☐	**Test Site – MRT Taiwan Laboratory**				
	Laboratory Location (Taiwan) No. 38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)				
	Laboratory Accreditations				
	TAF: 3261				
	FCC: 291082, TW3261		ISED: TW3261		

1.4. Product Information

Product Name	HPE Aruba User Experience Sensor
Model No.	ASIN0306
Wi-Fi Specification	802.11a/b/g/n/ac/ax
Bluetooth Specification	BLE only
ZigBee Specification	802.15.4
Power Type	AC/DC Adapter Input
Operating Temperature	0 ~ 40 °C
Operating Environment	Indoor Use
Integrated Modular Information	
Specification	Model Number: EG21-G FCC ID: XMR201906EG21G GSM 850, PCS 1900 Supported UTRA Band: 2, 4, 5 Supported E-UTRA Band: FDD Band: 2, 4, 5, 7, 12, 13, 25, 26 TDD Band: 38, 41 GNSS: GPS, BDS, GLONASS, Galileo
Accessories	
AC/DC Adapter	Model No.: WB-12G12R Input: 100-240V, 50/60Hz, 0.3A Max Output: 12.0V⎓1.0A 12.0W
Note: The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.	

1.5. Antenna Details

Wi-Fi and IoT Antenna

Antenna Type	Frequency Band (MHz)	T_X Paths	Directional Gain (dBi)		Beamforming Gain (dBi)
			Uncorrelated	Correlated	
Wi-Fi Antennas (Radio 0)					
PIFA Antenna	2400 ~ 2483.5	2	2.1	5.0	5.0
	5150 ~ 5250	2	3.5	6.5	6.5
	5250 ~ 5350	2	3.5	6.5	6.5
	5470 ~ 5725	2	3.5	6.3	6.3
	5725 ~ 5850	2	3.5	6.0	6.0
	5850 ~ 5895	2	3.6	6.2	6.2
Wi-Fi Antennas (Radio 1)					
PIFA Antenna	2400 ~ 2483.5	2	2.0	4.8	4.8
	5925 ~ 6425	2	2.7	5.5	5.5
	6425 ~ 6525	2	3.1	6.0	6.0
	6525 ~ 6875	2	3.1	6.0	6.0
	6875 ~ 7125	2	3.2	6.1	6.1
Bluetooth / ZigBee Antenna					
PIFA Antenna	2400 ~ 2483.5	1	2.3	--	--

Note:

1, The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

2, The EUT also supports Beam Forming mode, and the Beam Forming support 802.11n/ac/ax, not include 802.11a/b/g.

3, The antenna gain is from antenna report that was provided by the applicant.

EG21-G Module Antenna

Technology	Frequency Range (MHz)	Antenna Type	Max Peak Gain (dBi)
GSM 850	824 ~ 849	PIFA	0.1
PCS 1900	1850 ~ 1910		2.2
WCDMA Band II	1850 ~ 1910		2.2
WCDMA Band IV	1710 ~ 1755		3.7
WCDMA Band V	824 ~ 849		0.1
LTE Band 2	1850 ~ 1910		2.2
LTE Band 4	1710 ~ 1755		3.7
LTE Band 5	824 ~ 849		0.1
LTE Band 7	2500 ~ 2570		2.1
LTE Band 12	699 ~ 716		1.7
LTE Band 13	777 ~ 787		1.6
LTE Band 25	1850 ~ 1915		2.2
LTE Band 26	814~849		0.1
LTE Band 38	2570 ~ 2620		2.1
LTE Band 41	2496 ~ 2690		2.1
Note: The antenna gain is from antenna report that was provided by the applicant.			

1.6. Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 2.1091 & KDB 447498 D04 Interim General RF Exposure Guidance v01

2. RF Exposure Evaluation

2.1. Test Limits

According to FCC §1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in §1.1307(b)

Limits For Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*($900/f^2$)	<6
30-300	61.4	0.163	1.0	<6
300-1,500	--	--	f/300	<6
1,500-100,000	--	--	5	<6
(B) Limits for General Population/ Uncontrolled Exposures				
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
300-1,500	--	--	f/1500	<30
1,500-100,000	--	--	1.0	<30

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

2.1. MPE Exemptions

For single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph §1.1307(b)(2) of this section): A single RF source is exempt if:

(Option A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph §1.1307(b)(3)(ii)(A) of this section.
Medical implant devices may only use this exemption and that in paragraph §1.1307(b)(3)(ii)(A);

(Option B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). P is given by:

$$P_{th}\ (\text{mW}) = \begin{cases} ERP_{20\ cm}(d/20\ \text{cm})^{x} & d \le 20\ \text{cm} \\ ERP_{20\ cm} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases}$$

Where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ cm}\sqrt{f}}\right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20\ cm}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases}$$

d = the separation distance (cm);

(Option C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least λ/2π, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical

dimensions of the radiating structure(s) do not exceed the electrical length of λ/4 or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

Table 1 to §1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source Frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1920R^2$
1.34-30	$3450R^2/f^2$
30-300	$3.83R^2$
300-1,500	$0.0128R^2f$
1,500-100,000	$19.2R^2$

For multiple RF sources: Multiple RF sources are exempt if:

(A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those is paragraph §1.1307(b)(3)(i)(A) of this section. Medical implant devices may only use this exemption and that in paragraph §1.1307(b)(3)(i)(A).

(B) in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^{a} \frac{P_i}{P_{th,i}} + \sum_{j=1}^{b} \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^{c} \frac{Evaluated_k}{Exposure\ Limit_k} \leq 1$$

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph §1.1307(b)(3)(i)(B) of this section for P_{th}, including existing exempt transmitters and those being added.

b = number of fixed, mobile, or portable RF sources claiming exemption using paragraph §1.1307(b)(3)(i)(C) of this section for Threshold ERP, including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum

distance including existing evaluated transmitters.

P_i = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source *i* at a distance between 0.5 cm and 40 cm (inclusive).

$P_{th,i}$ = the exemption threshold power (P_{th}) according to paragraph §1.1307(b)(3)(i)(B) of this section for fixed, mobile, or portable RF source *i*.

ERP_j = the ERP of fixed, mobile, or portable RF source *j*.

$ERP_{th,j}$ = exemption threshold ERP for fixed, mobile, or portable RF source *j*, at a distance of at least λ/2π according to the applicable formula of paragraph §1.1307(b)(3)(i)(C) of this section.

$Evaluated_k$ = the maximum reported SAR or MPE of fixed, mobile, or portable RF source *k* either in the device or at the transmitter site from an existing evaluation at the location of exposure.

$Exposure\ Limit_k$ = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source *k*, as applicable from §1.1310 of this chapter.

2.2. Calculation Result

Product	HPE Aruba User Experience Sensor
Test Item	RF Exposure Evaluation

Test Mode	Frequency Band (MHz)	Turn-up Conducted Power (dBm)	Antenna Gain (dBi)	Max ERP (dBm)
BLE	2402 ~ 2480	10.0	2.3	10.15
ZigBee	2405 ~ 2480	10.0	2.3	10.15
802.11b/g/n/ax	2412 ~ 2462	23.0	2.1	22.95
802.11a/n/ac/ax	5180 ~ 5885	23.0	3.6	24.45
802.11ax	5955 ~ 7095	23.0	3.2	24.05
GSM 850	824 ~ 849	26.0	3.7	27.55
PCS 1900	1850 ~ 1910	23.0	3.7	24.55
WCDMA Band 2	1850 ~ 1910	25.0	3.7	26.55
WCDMA Band 4	1710 ~ 1755	25.0	3.7	26.55
WCDMA Band 5	824 ~ 849	25.0	3.7	26.55
LTE Band 2	1850 ~ 1910	25.0	3.7	26.55
LTE Band 4	1710 ~ 1755	25.0	3.7	26.55
LTE Band 5	824 ~ 849	25.0	3.7	26.55
LTE Band 7	2500 ~ 2570	25.0	3.7	26.55
LTE Band 12	699 ~ 716	25.0	3.7	26.55
LTE Band 13	777 ~ 787	25.0	3.7	26.55
LTE Band 25	1850 ~ 1915	25.0	3.7	26.55
LTE Band 26	814 ~ 849	25.0	3.7	26.55
LTE Band 38	2570 ~ 2620	25.0	3.7	26.55
LTE Band 41	2496 ~ 2690	25.0	3.7	26.55

Remark:

1. The Max Conducted power was extracted from the Modular tune-up power.
2. The GSM Max Conducted power included the slot factor.
3. The Max ERP (dBm) = Max Conducted Total Power (dBm) + Antenna Gain (dBi) - 2.15.
4. Tune-up power was declared by manufacturer.

For single RF source, Option B

Test Mode	Frequency Band (MHz)	R (m)	Max ERP (mW)	Threshold ERP (mW)
BLE	2402 ~ 2480	0.20	10.35	3060.0
ZigBee	2405 ~ 2480	0.20	10.35	3060.0
802.11b/g/n/ax	2412 ~ 2462	0.20	197.24	3060.0
802.11a/n/ac/ax	5180 ~ 5885	0.20	278.61	3060.0
802.11ax	5955~7095	0.20	254.10	3060.0
GSM 850	824 ~ 849	0.20	568.85	1681.0
PCS 1900	1850 ~ 1910	0.20	285.10	3060.0
WCDMA Band 2	1850 ~ 1910	0.20	451.86	3060.0
WCDMA Band 4	1710 ~ 1755	0.20	451.86	3060.0
WCDMA Band 5	824 ~ 849	0.20	451.86	1681.0
LTE Band 2	1850 ~ 1910	0.20	451.86	3060.0
LTE Band 4	1710 ~ 1755	0.20	451.86	3060.0
LTE Band 5	824 ~ 849	0.20	451.86	1681.0
LTE Band 7	2500 ~ 2570	0.20	451.86	3060.0
LTE Band 12	699 ~ 716	0.20	451.86	1426.0
LTE Band 13	777 ~ 787	0.20	451.86	1585.1
LTE Band 25	1850 ~ 1915	0.20	451.86	3060.0
LTE Band 26	814 ~ 849	0.20	451.86	1660.6
LTE Band 38	2570 ~ 2620	0.20	451.86	3060.0
LTE Band 41	2496 ~ 2690	0.20	451.86	3060.0
Note: R is from user manual.				

For multiple RF sources

The EUT supports Wi-Fi 2.4GHz + Wi-Fi 6GHz + IOT (BLE or Zigbee) + Cellular network, or Wi-Fi 2.4GHz + Wi-Fi 5GHz + IOT + Cellular network, or Wi-Fi 5GHz + Wi-Fi 6GHz + IOT + Cellular network simultaneous transmissions. The worst-case combination is Wi-Fi 5GHz + Wi-Fi 6GHz + IOT + GSM 850.

So the Max Simultaneous Transmission = 10.35/3060 (IOT) + 278.61/3060 (NII) + 254.10/3060 (6CD) + 568.85/1681 (GSM 850) = 0.5159 < 1

Therefore, the device qualifies for RF exposure test exemption.

The End