RF Exposure Evaluation Declaration

FCC ID: Q9DAPEX037457

APPLICANT: Hewlett Packard Enterprise Company

Application Type: Class III Permissive Change

Product: ACCESS POINT

Model No.: APEX0375

Trademark: aruba a Hewlett Packard Enterprise company , Hewlett Packard Enterprise

FCC Classification: Digital Transmission System (DTS)
Unlicensed National Information Infrastructure (UNII)

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Testing Laboratory
3261

Revision History

Report No.	Version	Description	Issue Date	Note
1806TW0108-U3	Rev. 01	Initial report	06-25-2018	Valid

1. PRODUCT INFORMATION

1.1. Equipment Description

Product Name:	ACCESS POINT
Model No.:	APEX0375
Brand Name:	aruba a Hewlett Packard Enterprise company , Hewlett Packard Enterprise
Wi-Fi Specification:	802.11a/b/g/n/ac
Bluetooth Specification:	v4.0 single mode
Software Version:	R660.1.1.0.3.016
Operating Temperature:	-40 ~ 65 °C
Power Type:	POE input or AC adapter input
Operating Environment:	Outdoor Use

Note 1: The applicant provide one POE adapter (Manufacturer: MICROSEMI & Model: PD-9001GR/AT/AC) for approval testing, it is not for sale.

1.2. Antenna Description

Polarization	Frequency Band (GHz)	Max Peak Gain (dBi)	30 Degree Antenna Gain (dBi)	BF Gain (dBi)	CDD Directional Gain (dBi)	
					For Power	For Power
Wi-Fi Internal Antenna List (2.4GHz 2*2 MIMO, 5GHz 4*4 MIMO)						
Directional (Note 3)	2.4	4.0	N/A	0.0	4.0	4.0
Directional (Note 3)	5	4.6	-4.0	3.0	4.6	7.6
Bluetooth Internal Antenna						
PCB	2.4	4.5	N/A			

Note:

1. The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.
   For CDD transmissions, directional gain is calculated as follows, N_{ANT} = 2, N_{SS} = 1.
   If all antennas have the same gain, G_{ANT}, Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.
   - For power spectral density (PSD) measurements on all devices,
     Array Gain = 10 log (N_{ANT}/ N_{SS}) dB = 3.01;
   - For power measurements on IEEE 802.11 devices,
     Array Gain = 0 dB for $N_{ANT} \leq 4$;
2. The EUT also supports Beam Forming mode, and the Beam Forming support 802.11n/ac, not include 802.11a/b/g.
   Directional gain = G_{ANT} + BF Gain, BF Gain was declared by the applicant.
3. These antennas have Cross-Polarized design, the detail see the antenna specification.

2. RF Exposure Evaluation

2.1. 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				
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	f/1500	6
1500-100,000	--	--	1	30

f= Frequency in MHz

Calculation Formula: $Pd = (Pout*G)/(4*pi*r^2)$

Where
Pd = power density in mW/cm^2
Pout = output power to antenna in mW
G = gain of antenna in linear scale
Pi = 3.1416
r = distance between observation point and center of the radiator in cm

Pd is the limit of MPE, $1mW/cm^2$. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

2.2. Test Result of RF Exposure Evaluation

Product	ACCESS POINT
Test Item	RF Exposure Evaluation

Antenna Gain: Refer to clause 1.2.

Maximum EIRP

Test Mode	Frequency Band (MHz)	Max Conducted Power (dBm)	Antenna Gain (dBi)	Max EIRP (dBm)
BLE	2402 ~ 2480	4.71	4.5	9.21
802.11b/g/n	2412 ~ 2462	29.02	4.0	33.02
802.11a/n/ac	5180 ~ 5320 5500 ~ 5720 5745 ~ 5825	28.37	7.6	35.97

Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Power Density at R = 20 cm (mW/cm^2)	Limit (mW/cm^2)	Power Density at R = 23 cm (mW/cm^2)
BLE	2402 ~ 2480	9.21	0.0017	1	0.0013
802.11b/g/n	2412 ~ 2462	33.50 (Note1)	0.4454	1	0.3368
802.11a/n/ac	5180 ~ 5320 5500 ~ 5720 5745 ~ 5825	36.10 (Note1)	0.8105	1	0.6128

Note1: Refer to operation description, Conducted power tolerance: +/- 0.5dBm.

CONCULISON:

Both of the WLAN 2.4GHz Band, WLAN 5GHz Band and BLE Band can transmit simultaneously.

The max Power Density at R (20 cm) = $0.0017mW/cm^2 + 0.4454mW/cm^2 + 0.8105mW/cm^2 = 1.2576mW/cm^2 > 1mW/cm^2$.

The max Power Density at R (23 cm) = $0.0013mW/cm^2 + 0.3368mW/cm^2 + 0.6128mW/cm^2 = 0.9509mW/cm^2 < 1mW/cm^2$.

Therefore, the Min Safety Distance is 23cm.

The End