



RF Exposure Evaluation Declaration

FCC ID: O9C-BJNGAFB0004

APPLICANT: Hewlett Packard Company

Application Type: Certification

Product: Wireless LAN Access Point

Model No.: BJNGA-FB0004, JG993A

Brand Name: HP

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

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The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

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Revision History

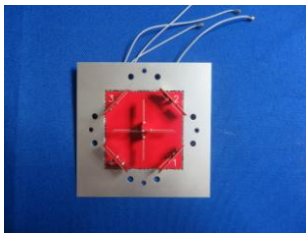

Report No.	Version	Description	Issue Date
1406RSU03305	Rev. 01	Initial report	07-14-2014
1406RSU03305	Rev. 02	Added some descriptions for EUT and the antenna	07-30-2014

1. PRODUCT INFORMATION

1.1. Equipment Description

Product Name	Wireless LAN Access Point
Model No.	BJNGA-FB0004, JG993A
Power Type	48Vdc, 0.63A (or POE input)
Frequency Range	<p><u>For 2.4G Band:</u></p> <p>802.11b/g/n: 2412 ~ 2462 MHz</p> <p><u>For 5.0G Band:</u></p> <p>802.11a/n/ac: 5150 ~ 5350MHz 5470 ~ 5725MHz 5725 ~ 5850MHz</p>
Type of Modulation	<p>802.11b: DSSS</p> <p>802.11g/a/n/ac: OFDM</p>
Maximum Average Output Power	<p>802.11b: 22.73dBm</p> <p>802.11g: 18.87dBm</p> <p>802.11n-HT20: 18.87dBm</p> <p>802.11n-HT40: 18.50dBm</p> <p>802.11a: 20.73dBm</p> <p>802.11n-HT20: 20.55dBm</p> <p>802.11n-HT40: 20.35dBm</p> <p>802.11ac-VHT20: 20.28dBm</p> <p>802.11ac-VHT40: 20.42dBm</p> <p>802.11ac-VHT80: 19.98dBm</p>
Adapter	<p>Brand Name: DVE</p> <p>M/N: DSA-42D-48 2 480063</p> <p>P/N: JD055B</p> <p>Input: 100-240V ~ 50/60Hz 1.2A</p> <p>Output: +48V ~ 0.63A</p>

1.2. Antenna Description

Antenna Type	Frequency Band (GHz)	Manufacturer	Model	Tx Paths	Max Peak Gain (dBi)	Directional Gain (dBi)	
						For Power	For PSD
Internal Antenna							
	2.4	Airgain, Inc.	N2465D	2	4	4	7.01
	5.2			2	5	5	8.01
	5.5			2	4.6	4.6	7.61
	5.8			2	4.9	4.9	7.91
External Antenna							
	2.4	Laird Technologies (Beijing) Co., Ltd.	JG696A	2	L1: 4.12 L2: 3.78	6.96	6.96
	5.2			2	H1: 5.65 H2: 6.21	8.94	8.94
	5.5			2	H1: 5.47 H2: 5.86	8.68	8.68
	5.8			2	H1: 5.45 H2: 5.36	8.42	8.42

Note:

1. The four antennas of the internal antenna are all the same, and the four antennas of the external antenna are different.
2. The EUT supports Cyclic Delay Diversity (CDD) mode, and CDD signals are correlated.

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: $Pd = (Pout \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

Pd = power density in mW/cm²

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/cm². 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	Wireless LAN Access Point
Test Item	RF Exposure Evaluation

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 6.96dBi for 2.4GHz, 8.94dBi for 5.2GHz, 8.68dBi for 5.5GHz and 8.42dBi for 5.8GHz in logarithm scale.

For 2.4G ISM Band:

Test Mode	Frequency Band (MHz)	Maximum Average Output Power (dBm)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)
802.11b	2412 ~ 2462	22.73	0.1852	1
802.11g	2412 ~ 2462	18.87	0.0762	1
802.11n-HT20	2412 ~ 2462	18.87	0.0762	1
802.11n-HT40	2422 ~ 2452	18.50	0.0699	1

For 5G UNII Band:

Test Mode	Frequency Band (MHz)	Maximum Average Output Power (dBm)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)
802.11a	5180 ~ 5240	20.69	0.1827	1
	5260 ~ 5320	20.23	0.1643	1
	5500 ~ 5700	19.28	0.1244	1
	5745 ~ 5825	20.73	0.1636	1
802.11n-HT20	5180 ~ 5240	20.55	0.1769	1
	5260 ~ 5320	20.37	0.1697	1
	5500 ~ 5700	20.10	0.1502	1
	5745 ~ 5825	20.20	0.1448	1
802.11n-HT40	5190 ~ 5230	20.20	0.1632	1
	5270 ~ 5310	19.83	0.1499	1
	5510 ~ 5670	19.91	0.1438	1
	5755 ~ 5795	20.46	0.1537	1

802.11ac-VHT20	5180 ~ 5240	20.28	0.1662	1
	5260 ~ 5320	20.02	0.1566	1
	5500 ~ 5720	19.97	0.1458	1
	5745 ~ 5825	20.25	0.1465	1
802.11ac-VHT40	5190 ~ 5230	20.18	0.1625	1
	5270 ~ 5310	20.26	0.1655	1
	5510 ~ 5710	20.02	0.1475	1
	5755 ~ 5795	20.42	0.1523	1
802.11ac-VHT80	5210	12.11	0.0253	1
	5290	11.96	0.0245	1
	5530 ~ 5690	19.98	0.1461	1
	5775	19.82	0.1327	1

CONCLUSION:

Both of the WLAN 2.4GHz Band and WLAN 5GHz Band can transmit simultaneously. Therefore, the Max Power Density at R (20 cm) = $0.1852\text{mW}/\text{cm}^2 + 0.1827\text{mW}/\text{cm}^2 = 0.3679\text{mW}/\text{cm}^2 < 1\text{mW}/\text{cm}^2$. So the EUT complies with the requirement.

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