

Company: Hewlett Packard Enterprise

Test of: APINR203, APINP203

To: FCC CFR 47 Part 1.1310

Report No.: HPEN96_MPE Rev A FCC All Bands

MPE/RF EXPOSURE TEST REPORT



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To: FCC CFR 47 Part 1.1310

Test Report Serial No.: HPEN96_MPE Rev A FCC All Bands

This report supersedes: NONE

Applicant: Hewlett Packard Enterprise
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Issue Date: 29th March 2017

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1. MAXIMUM PERMISSABLE EXPOSURE

Calculations for Maximum Permissible Exposure Levels

Power Density = Pd (mW/cm²) = EIRP/(4*π*d²)

EIRP = P * G

P = Peak output power (mW)

G = Antenna numeric gain (numeric)

d = Separation distance (cm)

Numeric Gain = 10 ^ (G (dBi)/10)

These calculations represent worst case in terms of the exposure levels.

Freq. Band (MHz)	Total Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Power Density (mW/cm ²) @ 20cm	Power Density Limit (mW/cm ²)	Min Calculated safe distance for Limit (cm)	Calculated Power Density (mW/cm ²) @ Safe Distance
2400.0 - 2483.5 (BLE)	1.00	1.26	4.11	2.58	0.001	1.00	1	0.001
2400.0 - 2483.5 (WiFi 1x1)	1.00	1.26	20.30	107.15	0.027	1.00	4	0.027
5725.0 - 5850.0 (WiFi 1x1)	2.90	1.95	17.51	56.36	0.022	1.00	3	0.022
5150.0 - 5250.0 (WiFi 1x1)	2.90	1.95	16.85	48.42	0.019	1.00	3	0.019
5470.0 - 5725.0 (WiFi 1x1)	2.90	1.95	17.27	53.33	0.021	1.00	3	0.021
5250.0 - 5350.0 (WiFi 1x1)	2.90	1.95	16.98	49.89	0.020	1.00	3	0.020
2400.0 - 2483.5 (WiFi 2x2)	1.00	1.26	23.18	208.14	0.052	1.00	5	0.052
5725.0 - 5850.0 (WiFi 2x2)	5.90	4.0	17.60	57.54	0.045	1.00	5	0.045
5150.0 - 5250.0 (WiFi 2x2)	5.90	4.0	17.47	55.85	0.043	1.00	5	0.043
5250.0 - 5350.0 (WiFi 2x2)	5.90	4.0	17.32	53.95	0.042	1.00	5	0.042
5470.0 - 5725.0 (WiFi 2x2)	5.90	4.0	18.12	64.86	0.050	1.00	5	0.050

Total Gain (dBi) = Antenna Gain + Beamforming Gain (if applicable).

1. Assessment for simultaneous operation: 2.4GHz BLE, 2.4GHz WiFi 1x1, 5GHz WiFi 1x1

Freq. Band (MHz)	Total Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Safe Distance for Summation (cm)	Power Density Limit (mW/cm ²) E _{ref}	Power Density (mW/cm ²) @New Distance E _i	Summation E _i /E _{ref}
2400.0 - 2483.5 (BLE)	1.00	1.26	4.11	2.58	20	1.00	0.001	0.001
2400.0 - 2483.5 (WiFi 1x1)	1.00	1.26	20.30	107.15	20	1.00	0.03	0.027
5725.0 - 5850.0 (WiFi 1x1)	2.90	1.95	17.51	56.36	20	1.00	0.02	0.022

Total Evaluation: 0.049

The Total Evaluation was calculated using the formula:

$$\sum_{i=1}^n E_i / E_{ref} \leq 1$$

Where

E_i: calculated E-field Strength for transmitter

E_{ref}: E-field strength related limit

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2. Assessment for simultaneous operation: 2.4GHz BLE, 2.4GHz WiFi 2x2

Freq. Band (MHz)	Total Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Safe Distance for Summation (cm)	Power Density Limit (mW/cm ²) E _{ref}	Power Density (mW/cm ²) @New Distance E _i	Summation E _i /E _{ref}
2400.0 - 2483.5 (BLE)	1.00	1.26	4.11	2.58	20	1.00	0.001	0.001
2400.0 - 2483.5 (WiFi 2x2)	1.00	1.26	23.18	208.14	20	1.00	0.052	0.052
Total Evaluation:								0.053

The Total Evaluation was calculated using the formula:

$$\sum_{i=1}^n E_i / E_{ref} \leq 1$$

Where

E_i: calculated E-field Strength for transmitter

E_{ref}: E-field strength related limit

3. Assessment for simultaneous operation: 2.4GHz BLE, 5GHz WiFi 2x2

Freq. Band (MHz)	Total Gain (dBi)	Numeric Gain (numeric)	Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Safe Distance for Summation (cm)	Power Density Limit (mW/cm ²) E _{ref}	Power Density (mW/cm ²) @New Distance E _i	Summation E _i /E _{ref}
2400.0 - 2483.5 (BLE)	1.00	1.26	4.11	2.58	20	1.00	0.001	0.001
5470.0 - 5725.0 (WiFi 2x2)	5.90	3.90	18.12	64.86	20	1.00	0.050	0.050
Total Evaluation:								0.051

The Total Evaluation was calculated using the formula:

$$\sum_{i=1}^n E_i / E_{ref} \leq 1$$

Where

E_i: calculated E-field Strength for transmitter

E_{ref}: E-field strength related limit

Note: for mobile or fixed location transmitters the minimum separation distance is 20cm, even if calculations indicate the MPE distance to be less.

Specification - Maximum Permissible Exposure Limits.

The Limit is defined in Table 1 of FCC §1.1310.

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