

## RF Exposure Report

**Report No.:** SA190614E02 R1

**FCC ID:** B94SNPRC1950

**Test Model:** SNPRC-1950

**Received Date:** June 14, 2019

**Test Date:** Aug. 30 to 31, 2019

**Issued Date:** Sep. 23, 2019

**Applicant:** HP Inc.

**Address:** 3390 East Harmony Road, MS 66 Fort Collins, CO 80528

**Manufacturer:** HP Singapore (Private) Limited

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Hsin Chu Laboratory

**Lab Address:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

**Test Location:** E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,  
Taiwan R.O.C.

**FCC Registration /  
Designation Number:** 723255 / TW2022

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### Release Control Record

Issue No.	Description	Date Issued
SA190614E02	Original release.	Sep. 18, 2019
SA190614E02 R1	Modify the applicant and manufacturer information.	Sep. 23, 2019

## 1 Certificate of Conformity

**Product:** 802.11a/b/g/n/ac (2.4 / 5 GHz) Wi-Fi radio + BT Radio Module

**Brand:**



**Test Model:** SNPRC-1950

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** HP Inc.

**Manufacturer:** HP Singapore (Private) Limited

**Test Date:** Aug. 30 to 31, 2019

**Standards:** FCC CFR 47 Part 1.1310  
FCC CFR 47 Part 2.1091  
KDB 447498 D01 General RF Exposure Guidance v06  
IEEE C95.1-1992

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**Prepared by :** Phoenix Huang, **Date:** Sep. 23, 2019  
Phoenix Huang / Specialist

**Approved by :** May Chen, **Date:** Sep. 23, 2019  
May Chen / Manager

## 2 RF Exposure

### 2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f <sup>2</sup> )*	30
30-300	27.5	0.073	0.2	30
300-1500	...	...	f/1500	30
1500-100,000	...	...	1.0	30

f = Frequency in MHz ; \*Plane-wave equivalent power density

### 2.2 MPE Calculation Formula

$$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$$

where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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

### 2.3 Classification

The antenna of this product, under normal use condition, is at least 20 cm away from the body of the user. So, this device is classified as **Mobile Device**.

## 2.4 Antenna Gain

Internal Antenna						
Antenna No.	Brand	Model	Ant. Net Gain (dBi)	Frequency range (GHz)	Antenna Type	Connector Type
1	HP Inc.	SNPRC-1950	3.5	2.4-2.5	PCB	None
			4.5	5-6		
External Antenna						
2	Yageo	ANTX300P002B24553	0.9	2.4-2.5	PCB	i-pex(MHF)
			2.3	5.150-5.875		
3	Pulse	SZ0595D	2.5	2.4-2.5	PIFA	i-pex(MHF)
			3	4.9-5.9		
4	Yageo	ANTX200P002B24553	0.9	2.4-2.5	PCB	i-pex(MHF)
			2.3	5.150-5.875		
5	Pulse	SZ07751	2.5	2.4-2.5	PIFA	i-pex(MHF)
			3	4.9-5.9		

### Note:

1. The external antenna will fix transmission on Chain 1
2. The Bluetooth technology will fix transmission on Chain 1

## 2.5 Calculation Result of Maximum Conducted Power

Operation Mode	Evaluation Frequency (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
WLAN (2.4GHz)	2437	516.416	3.5	20	0.23000	1
WLAN (U-NII-1)	5200	156.315	4.5	20	0.08765	1
WLAN (U-NII-2A)	5300	156.675	4.5	20	0.08785	1
WLAN (U-NII-2C)	5580	164.816	4.5	20	0.09241	1
WLAN (U-NII-3)	5745	145.546	4.5	20	0.08161	1
BT-EDR	2402	7.907	3.5	20	0.00352	1
BT-LE	2402	4.645	3.5	20	0.00207	1

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

### Conclusion:

The formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + Bluetooth =  $0.23000 / 1 + 0.00352 / 1 = 0.23352$

WLAN 5GHz + Bluetooth =  $0.09241 / 1 + 0.00352 / 1 = 0.09593$

Therefore the maximum calculations of above situations are less than the "1" limit.

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