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 / Specialist , **Date:** Sep. 23, 2019

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

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^2)	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	($180/f^2$)*	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

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

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

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^2)	Limit (mW/cm^2)
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 + ……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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