RF EXPOSURE EVALUATION REPORT

FCC ID	:	**B94SNPRC2150**
Equipment	:	**802.11b/g/n (2.4GHz) Wi-Fi + BT / BLE Radio Module**
Brand Name	:	
Model Name	:	**SNPRC-2150**
Applicant	:	**HP Singapore (Private) Limited** **1 Depot Close, Singapore 109841**
Manufacturer	:	**HP Inc.** **1501 Page Mill Road, Palo Alto 94304, U.S.A.** **650-857-1501**
Standard	:	**47 CFR Part 2.1091**

We, SPORTON INTERNATIONAL INC has been evaluated this product in accordance with 47 CFR Part 2.1091 and it complies with applicable limit.

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC evaluation.

The results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full

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Approved by: Cona Huang / Deputy Manager

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History of this test report

Report No.	Version	Description	Issued Date
FA200819001	Rev. 01	Initial issue of report	Feb. 05, 2021

1. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	802.11b/g/n (2.4GHz) Wi-Fi + BT / BLE Radio Module
Brand Name	
Model Name	SNPRC-2150
FCC ID	B94SNPRC2150
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2400 MHz ~ 2483.5 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz
Mode	WLAN: 802.11b/g/n HT20 Bluetooth BR/EDR/LE
EUT Stage	Identical Prototype

Sample Information			
Sample	Sample 1	Sample 2	Sample 3
Labelled	0960-4992	0960-4991	0960-4977
Antenna	Main: PCB Antenna	Main: PCB Antenna	Main: PCB Antenna
	Aux.: PCB Antenna	Aux.: External Antenna with cable 300mm (or 200mm)	Aux.: PCB Antenna
Config	Miligrid / 12 pin header connector	Miliigrid / 12 pin header connector	FFC connector

Reviewed by: Jason Wang

Report Producer: Daisy Peng

2. Maximum RF average output power among production units

<2.4GHz WLAN>

Transmit Antenna				Main Ant.	Aux Ant.
	Mode	Channel	Frequency (MHz)	Tune-Up Limit	Tune-Up Limit
2.4GHz WLAN	802.11b 1Mbps	1	2412	18.00	18.00
		6	2437	20.50	20.50
		11	2462	20.00	18.50
	802.11g 6Mbps	1	2412	16.00	15.50
		2	2417	17.00	18.00
		6	2437	19.50	19.50
		10	2457	18.00	17.50
		11	2462	16.50	16.00
	802.11n-HT20 MCS0	1	2412	16.50	16.00
		2	2417	17.00	18.00
		6	2437	19.50	19.50
		10	2457	18.00	17.50
		11	2462	17.00	16.00

<Bluetooth Main Ant.>

Mode	Average power (dBm)			
	BR / EDR			LE
	1Mbps	2Mbps	3Mbps	1Mbps
Tune-up Limit	9	5.5	5.5	6

<Bluetooth Aux Ant.>

Mode	Average power (dBm)			
	BR / EDR			LE
	1Mbps	2Mbps	3Mbps	1Mbps
Tune-up Limit	9	5.5	5.5	6

3. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f2)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:
S = Power Density
P = Output Power at Antenna Terminals
G = Gain of Transmit Antenna (linear gain)
R = Distance from Transmitting Antenna

4. Radio Frequency Radiation Exposure Evaluation

4.1. Standalone Power Density Calculation

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm^2)	Limit (mW/cm^2)	Power Density / Limit
WLAN2.4GHz Band	2400	4.0	20.5	24.5	0.28	281.84	0.056	1.000	0.056
Bluetooth	2400	4.0	9.0	13.0	0.02	19.95	0.004	1.000	0.004

2.4GHz WLAN Power Density / Limit	Bluetooth Power Density / Limit	∑(Power Density / Limit) of 2.4GHz WLAN+Bluetooth
0.056	0.004	0.060

Note:

1. ∑(Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for 2.4GHz WLAN + Bluetooth.
2. Considering the 2.4GHzWLAN collocation with the Bluetooth transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 2 collocated transmitters is compliant

Conclusion:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.