RF Exposure Report

Report No.:	SA191227E04
FCC ID:	C3K1888
Test Model:	1888
Received Date:	Dec. 27, 2019
Test Date:	Apr. 21, 2020
Issued Date:	June 12, 2020
Applicant:	Microsoft Corporation
Address:	One Microsoft Way,Redmond,Washington 98052-6399,United States
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
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
SA191227E04	Original release.	June 12, 2020

1 Certificate of Conformity

Product:	802.11a/b/g/n/ac 2T2R dual-band wireless LAN radio
Brand:	Microsoft
Test Model:	1888
Sample Status:	ENGINEERING SAMPLE
Applicant:	Microsoft Corporation
Test Date:	Apr. 21, 2020
Standards:	FCC Part 2 (Section 2.1091) IEEE C95.3 -2002
References Test Guidance:	KDB 447498 D01 General RF Exposure Guidance v06

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:** June 12, 2020

Phoenix Huang / Specialist

Approved by : , **Date:** June 12, 2020

Clark Lin / Technical 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^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

Ant. No.	Transmitter Circuit	Ant.Gain (dBi)	Freq. Range (GHz)	Ant. Type	Connector Type
1	0	4.45	2.4~2.4835	PCB	None
		5.6	5.15~5.25		
		5.97	5.25~5.35		
		5.93	5.47~5.725		
		6.3	5.725~5.85		
2	1	4.02	2.4~2.4835	PCB	None
		4.47	5.15~5.25		
		5.4	5.25~5.35		
		7.22	5.47~5.725		
		7.15	5.725~5.85		

2.5 Calculation Result of Maximum Conducted Power

Operation Mode	Evaluation Frequency (MHz)	Max. Average Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
WLAN (2.4GHz)	2412~2462	86.541	4.24	20	0.0457	1
WLAN (U-NII-1)	5180~5250	59.152	5.07	20	0.03782	1
WLAN (U-NII-2A)	5260~5320	57.011	5.69	20	0.04204	1
WLAN (U-NII-2C)	5500~5720	56.176	6.62	20	0.05132	1
WLAN (U-NII-3)	5745~5825	60.59	6.75	20	0.05703	1

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. 2.4GHz: Directional gain = 10 log[($10^{G0/10}$ + $10^{G1/10}$) / 2] = 4.24 dBi
3. 5GHz:
   U-NII-1: Directional gain = 10 log[($10^{G0/10}$ + $10^{G1/10}$) / 2] = 5.07 dBi
   U-NII-2A: Directional gain = 10 log[($10^{G0/10}$ + $10^{G1/10}$) / 2] = 5.69 dBi
   U-NII-2C: Directional gain = 10 log[($10^{G0/10}$ + $10^{G1/10}$) / 2] = 6.62 dBi
   U-NII-3: Directional gain = 10 log[($10^{G0/10}$ + $10^{G1/10}$) / 2] = 6.75 dBi
4. This max average power could cover tune-up power tolerance.

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