

RF Exposure Report

Report No.: SA200206E05B R2

FCC ID: C3K1884

Test Model: 1884

Received Date: June 05, 2020

Test Date: July 09, 2020

Issued Date: Jan. 06, 2021

Applicant: Microsoft Corporation

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**FCC Registration /
Designation Number:** 723255 / TW2022

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Release Control Record

| Issue No. | Description | Date Issued |
|-----------------|---|---------------|
| SA200206E05B | Original release. | Oct. 16, 2020 |
| SA200206E05B R1 | Modify the note 1 description of section 2.1. | Dec. 17, 2020 |
| SA200206E05B R2 | Modified the statement on page 1. | Jan. 06, 2021 |

1 Certificate of Conformity

Product: 802.11a/b/g/n/ac 2T2R dual-band wireless LAN radio

Brand: Microsoft

Test Model: 1884

Sample Status: ENGINEERING SAMPLE

Applicant: Microsoft Corporation

Test Date: July 09, 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:** Jan. 06, 2021
Phoenix Huang / Specialist

Approved by : Clark Lin, **Date:** Jan. 06, 2021
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

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

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 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

| Freq. Range (GHz) | Original | | Newly | | Ant. Type | Connector Type |
|-------------------|-----------------------|------------------------|-----------------------|------------------------|-----------|----------------|
| | Ant. No. 1 Gain (dBi) | Ant. No. 2. Gain (dBi) | Ant. No. 1 Gain (dBi) | Ant. No. 2. Gain (dBi) | | |
| | Chian 0 | Chain 1 | Chian 0 | Chain 1 | | |
| 2.4~2.4835 | 2.88 | 3.62 | 2.77 | 5.26 | PCB | None |
| 5.15~5.25 | 3.43 | 3.41 | 3.06 | 3.78 | | |
| 5.25~5.35 | 3.65 | 3.56 | 3.44 | 3.14 | | |
| 5.47~5.725 | 3.22 | 3.74 | 3.83 | 2.79 | | |
| 5.725~5.85 | 3.52 | 3.2 | 3.19 | 2.05 | | |

2.5 Calculation Result of Maximum Conducted Power

All test data was copied from the original test report (Report No.: SA200206E05)

| 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 | 89.898 | 3.27 | 20 | 0.03797 | 1 |
| WLAN (U-NII-1) | 5180~5250 | 62.543 | 3.42 | 20 | 0.02735 | 1 |
| WLAN (U-NII-2A) | 5260~5320 | 69.112 | 3.61 | 20 | 0.03157 | 1 |
| WLAN (U-NII-2C) | 5500~5720 | 57.931 | 3.49 | 20 | 0.02574 | 1 |
| WLAN (U-NII-3) | 5745~5825 | 63.567 | 3.36 | 20 | 0.02741 | 1 |

Note:

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- 2.4GHz: Directional gain = $10 \log[(10^{G0/10} + 10^{G1/10}) / 2] = 3.27 \text{ dBi}$
- 5GHz:
 - U-NII-1: Directional gain = $10 \log[(10^{G0/10} + 10^{G1/10}) / 2] = 3.42 \text{ dBi}$
 - U-NII-2A: Directional gain = $10 \log[(10^{G0/10} + 10^{G1/10}) / 2] = 3.61 \text{ dBi}$
 - U-NII-2C: Directional gain = $10 \log[(10^{G0/10} + 10^{G1/10}) / 2] = 3.49 \text{ dBi}$
 - U-NII-3: Directional gain = $10 \log[(10^{G0/10} + 10^{G1/10}) / 2] = 3.36 \text{ dBi}$
- This max average power could cover tune-up power tolerance.
- 2.4GHz and 5GHz technology cannot transmit at same time.

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