

## RF Exposure Report

**Report No.:** SA170326E01

**FCC ID:** C3K1802

**Test Model:** 1802

**Received Date:** Mar. 26, 2017

**Test Date:** May 25, 2017

**Issued Date:** June 23, 2017

**Applicant:** Microsoft Corporation

**Address:** One Microsoft Way Redmond WA 98052

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

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### Release Control Record

| Issue No.   | Description       | Date Issued   |
|-------------|-------------------|---------------|
| SA170326E01 | Original release. | June 23, 2017 |

## 1 Certificate of Conformity

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

**Brand:** Microsoft

**Test Model:** 1802

**Sample Status:** ENGINEERING SAMPLE

**Applicant:** Microsoft Corporation

**Test Date:** May 25, 2017

**Standards:** FCC Part 2 (Section 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 :** Wendy Wu , **Date:** June 23, 2017  
Wendy Wu / Specialist

**Approved by :** May Chen , **Date:** June 23, 2017  
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

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

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 20cm away from the body of the user.  
So, this device is classified as **Mobile Device**.

### 2.4 Antenna Gain

| Transmitter Circuit | Antenna Type | Connector Type | Antenna Gain(dBi) | Frequency range (MHz to MHz) | Antenna Type |
|---------------------|--------------|----------------|-------------------|------------------------------|--------------|
| Chain (0)           | Microsoft    | NA             | 5.6               | 2400~2500                    | PCB          |
|                     |              |                | 6.8               | 5150~5850                    |              |
| Chain (1)           | Microsoft    | NA             | 5.5               | 2400~2500                    | PCB          |
|                     |              |                | 6.3               | 5150~5850                    |              |

For 1TX configuration mode: max gain was selected as representative antenna.

## 2.5 Calculation Result

### 1TX Mode

| Frequency Band (MHz) | Max Power (mW) | Max Power (dBm) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|----------------------|----------------|-----------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 2412-2462            | 354.813        | 25.50           | 5.60               | 20            | 0.25629                             | 1                           |
| 5180-5240            | 316.228        | 25.00           | 6.80               | 20            | 0.30111                             | 1                           |
| 5260-5320            | 316.228        | 25.00           | 6.80               | 20            | 0.30111                             | 1                           |
| 5500-5720            | 316.228        | 25.00           | 6.80               | 20            | 0.30111                             | 1                           |
| 5745-5825            | 316.228        | 25.00           | 6.80               | 20            | 0.30111                             | 1                           |

### 2TX Mode

| Frequency Band (MHz) | Max Power (mW) | Max Power (dBm) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|----------------------|----------------|-----------------|--------------------|---------------|-------------------------------------|-----------------------------|
| 2412-2462            | 355.656        | 25.51           | 5.60               | 20            | 0.25690                             | 1                           |
| 5180-5240            | 316.978        | 25.01           | 6.80               | 20            | 0.30183                             | 1                           |
| 5260-5320            | 316.978        | 25.01           | 6.80               | 20            | 0.30183                             | 1                           |
| 5500-5720            | 316.978        | 25.01           | 6.80               | 20            | 0.30183                             | 1                           |
| 5745-5825            | 632.456        | 28.01           | 6.80               | 20            | 0.60223                             | 1                           |

**NOTE:** 1. This power include tune-up tolerance range that specified in 1803 Tune Up power table.

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