



# RF Exposure Evaluation Report

For

MODEL NO. 1619

FCC ID: C3K1619

Test Report No. R-TR53-MPE-2

Issue Date: September 26, 2014

FCC CFR47 Part 2.1093

*Prepared by*

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## 1 Record of Revisions

Revision	Date	Section	Page(s)	Summary of Changes	Author/Revised By:
1.0	9/25/2014	All	All	First Version	Jennifer Liu
2.0	9/26/2014	6.2	7	Corrected calculation.	Jennifer Liu

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# Test Report Attestation

**Microsoft Corporation**

**Model: 1619**

**FCC ID: C3K1619**

## Applicable Standards

Specification	Test Result
FCC CFR47 Rule Parts 2.1093	Complies

Microsoft EMC Laboratory attests that the product model identified in this report has been tested to and meets the requirements identified in the above standards. The test results in this report solely pertains to the specific sample tested, under the conditions and operating modes as provided by the customer. All indications of Pass/Fail in this report are opinions expressed by the Microsoft EMC Laboratory based on interpretations and/or observations of test result on the tested sample only.

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## 2 Product Description

Company Name:	Microsoft Corporation
Address:	One Microsoft Way
City, State, Zip:	Redmond, WA 98052-6399
Customer Contact:	Brad Sybouts
Functional Description of the EUT:	Mobile Wireless Device
Model:	1619
FCC ID:	C3K1619
Radio Description:	BT, BT LE (2402- 2480 MHz)
Modulation:	GFSK, $\pi/4$ -DQPSK and 8DPSK
EUT Classification:	FHSS, DTS
Equipment Design State:	EV5
Equipment Condition:	Good
RF Exposure Conditions:	Extremity Exposure, Body Exposure

## 3 Deviations from Standards

None.

## 4 Facilities and Accreditations

### 4.1 Test Facility

All test facilities used to collect the test data are located at Microsoft EMC Laboratory,  
17760 NE 67<sup>th</sup> Ct,  
Redmond WA, 98052, USA

### 4.2 Accreditations

The lab is established and follows procedures as outlined in IEC/ISO 17025 and A2LA accreditation requirements.  
A2LA Accredited Testing Certificate Number: 3472.01  
FCC Registration Number: US1141

### 4.3 Test Configurations

#### Test Software Details:

BT Compliance Tool, Version 1.0.17 for controlling and operating BT/BTLE radio functionality.

#### Modes of Operation and Channel Details:

BT: Channels 0-78 (2402 - 2480 MHz)  
BTLE: Channels 0-39 (2402 – 2480MHz)

## 5 Conducted Output Power Measurements

### 5.1 Test Method

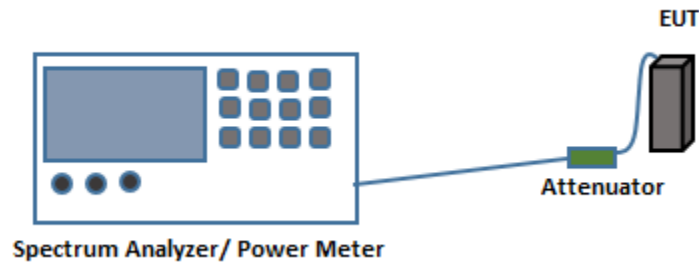


Fig.1. Test Setup for Antenna port conducted measurements

### 5.2 Test Equipment List

Manufacturer	Description	Model #	Asset #	Calibration Due
Agilent	Spectrum Analyzer	N9030A	RF-011	6/6/2015

### 5.3 Test Results

#### 5.3.1 Bluetooth Test Results

Frequency (MHz)	Mode	Channel No.	Peak Power (dBm)	Peak Power (W)	Average Power (dBm)	Average Power (W)
2402	DH5	0	0.723	0.0012	0.52744	0.0011
2441	DH5	39	1.542	0.0014	1.3835	0.0014
2480	DH5	78	1.575	0.0014	1.4212	0.0014
2402	2-DH5	0	2.872	0.0019	0.54563	0.0011
2441	2-DH5	39	3.57	0.0023	1.3488	0.0014
2480	2-DH5	78	3.597	0.0023	1.426	0.0014
2402	3-DH5	0	3.257	0.0021	0.54315	0.0011
2441	3-DH5	39	3.944	0.0025	1.3498	0.0014
2480	3-DH5	78	3.964	0.0025	1.4864	0.0014

#### 5.3.2 Bluetooth LE Test Results

Frequency (MHz)	Mode	Channel No.	Peak Power (dBm)	Peak Power (W)	Average Power (dBm)	Average Power (W)
2402	LE	0	0.723	0.0012	0.514	0.0011
2440	LE	19	1.555	0.0014	1.361	0.0014
2480	LE	39	1.658	0.0015	1.437	0.0014

## 6 SAR Test Exclusion

### 6.1 SAR Test Exclusion Criteria

According to FCC KDB 447498 D01 General RF Exposure Guidance v05r02 (Feb. 2014) Section 4.3.1, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances  $\leq 50$  mm is defined as

$$\frac{(\text{max.power of channel, including tune-up tolerance, mW})}{(\text{min.test separation distance, mm})} \times [\sqrt{f_{(\text{GHz})}}] \leq 3.0$$

where

- $f_{(\text{GHz})}$  is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

When the minimum test separation distance is  $< 5$  mm, a distance of 5 mm is applied to determine SAR test exclusion.

### 6.2 SAR Test Exclusion Evaluation

SAR Exclusion Threshold value =  $[(2\text{mW}/5\text{mm}) * \sqrt{2.48}] = 0.63$

(Using the worst case average power of 2mW for both BT and BT LE modes)

Since the rounded result of 0.6 is  $\leq 3.0$ , SAR test is excluded for both 1-g and 10-g SAR.

End of Report