



RF Exposure Evaluation Report

For

MODEL NO. 1776

FCC ID: C3K1776

IC ID: 3048A-1776

Test Report No. R-TR423-FCCISED-MPE-2

Issue Date: May 24, 2017

FCC CFR47 Part 2.1093

Innovation, Science and Economic Development

Canada RSS-102 Issue 5

Prepared by

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TESTING CERT #3472.01

1 Record of Revisions

Revision	Date	Section	Page(s)	Summary of Changes	Author/Revised By:
1.0	05/17/2017	All	All	Version 1.0	Nisha Nandakumar
2.0	05/24/2017	6.1.1	9	Added a note regarding test separation distance used for the evaluation.	Nisha Nandakumar

Table of Contents

1	Record of Revisions.....	2
2	Deviations from Standards	5
3	Facilities and Accreditations	5
3.1	Test Facility	5
3.2	Accreditations	5
4	Product Description	6
4.1	Test Configurations	6
5	Peak Conducted Output Power Measurements	7
5.1	Test Method.....	7
5.2	Test Equipment List.....	7
5.3	Test Results.....	8
6	SAR Test Exclusion	9
6.1	FCC	9
6.1.1	SAR Test Exclusion Criteria	9
6.1.2	FCC SAR Test Exclusion Evaluation	9
6.2	ISED	10
6.2.1	SAR Test Exclusion Criteria	10
6.2.2	ISED SAR Test Exclusion Evaluation	10

Test Report Attestation

Microsoft Corporation

Model: 1776

FCC ID: C3K1776

IC ID: 3048A-1776

Applicable Standards

Specification	Test Result
RF Exposure requirements from: FCC CFR47 Part 2.1093 Innovation, Science and Economic Development Canada RSS-102 Issue 5	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.

This report shall not be used to claim product certification, approval, or endorsement by A2LA or any agency of any Government.

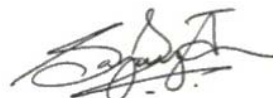
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This report replaces the previously issued report #R-TR423-FCCISED-MPE-1 issued by Microsoft EMC Labs on 05/17/2017.



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Radio Test Engineer



Reviewed/ Issued By: Sajay Jose

EMC/RF Compliance Lab Manager

2 Deviations from Standards

None.

3 Facilities and Accreditations

3.1 Test Facility

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

3.2 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

4 Product Description

Company Name:	Microsoft Corporation
Address:	One Microsoft Way
City, State, Zip:	Redmond, WA 98052-6399
Customer Contact:	Sahithi Kandula
Functional Description of the EUT:	Wireless input accessory device
Model:	1776
FCC ID:	C3K1776
IC ID:	3048A-1776
Radio Description:	BT LE (2402- 2480 MHz)
Modulation:	GFSK
Antenna Type and Gain:	Internal Gain: +1.87 dBi
EUT Classification:	DTS
Equipment Design State:	Prototype/Production Equivalent
Equipment Condition:	Good
Test Sample Details:	RF Conducted Test Sample SN(s): 0222672710674
RF Exposure Conditions:	Extremity Exposure, Body Exposure

4.1 Test Configurations

EUT was preprogrammed to transmit in low, mid and high channels of Bluetooth LE mode. The device can operate in only GFSK modulation. Channel numbers 0, 19 and 39 were used as Low, Mid and High Channels respectively.

5 Peak Conducted Output Power Measurements

5.1 Test Method

Antenna port conducted measurements were performed on a bench-top setup consisting of a spectrum analyzer, power meter (as necessary), splitters/combiners (as necessary), attenuators, and pre-characterized RF cables.

Measurements were performed according to the procedure defined in KDB 558074 - Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 V04 and ANSI C63.10 2013.

Spectrum Analyzer settings:

Peak Power:

RBW= 1 MHz

VBW= 3 MHz

Trace Mode= Peak Detector (Max Hold)

Sweep time= Auto Couple

Span= 3 MHz

EIRP was calculated based on the following formula:

$$e.i.r.p.(dBm) = Conducted\ Output\ Power\ (dBm) + Antenna\ Gain\ (dBi)$$

5.2 Test Equipment List

Manufacturer	Description	Model #	Asset #	Calibration Due
Agilent	Spectrum Analyzer	N9030A	EMC-605	7/21/2017

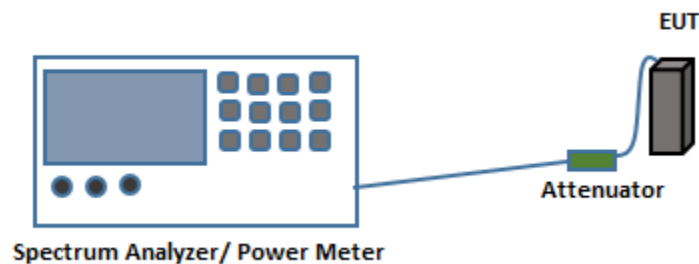


Fig.1. Test setup for antenna port conducted measurements

5.3 Test Results

Frequency (MHz)	Mode	Measured Peak Conducted Power (dBm)	Measured Peak Conducted Power (mW)	Maximum Antenna Gain (dBi)	E.I.R.P. (dBm)	E.I.R.P. (mW)
2402	BTLE	1.61	1.45	1.87	3.48	2.23
2440	BTLE	1.55	1.43	1.87	3.42	2.19
2480	BTLE	1.22	1.32	1.87	3.09	2.04

6 SAR Test Exclusion

6.1 FCC

6.1.1 SAR Test Exclusion Criteria

According to FCC KDB 447498 D01 General RF Exposure Guidance v06 (Oct 2015) Section 4.3.1, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 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.

6.1.2 FCC SAR Test Exclusion Evaluation

The EUT was excluded from routine SAR evaluation measurements, since the SAR test exclusion criteria were met.

Frequency (MHz)	Peak Conducted Output Power (dBm)	Peak Conducted Output Power (mW)	Calculated SAR Exclusion Threshold	SAR Exclusion Limit	Result
2402	1.61	1.45	0.46	<3.0	SAR Test Not Required

6.2 ISED

6.2.1 SAR Test Exclusion Criteria

For limb worn devices, with a separation distance <5mm, SAR evaluation is exempt for transmitters operating with an output power < 10mW at 2450 MHz (RSS-102 Table 1).

6.2.2 ISED SAR Test Exclusion Evaluation

The EUT was excluded from routine SAR evaluation measurements, since the SAR test exclusion criteria were met.

Frequency (MHz)	Peak Conducted Output Power (dBm)	Peak Conducted Output Power (mW)	Antenna Gain (dBi)	E.I.R.P (dBm)	E.I.R.P (mW)	SAR Exclusion Limit (mW)	Result
2402	1.61	1.45	1.87	3.48	2.23	10	SAR Test Not Required

End of Report