



RF Exposure Evaluation Report

For

MODEL NO. 1756

FCC ID: C3K1756

IC ID: 3048A-1756

Test Report No. R-TR378-FCCIC-RFE-2

Issue Date: 26 Sep, 2016

FCC CFR47 Part 2.1093

ISED Canada RSS-102: Issue 5

Prepared by

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1 Record of Revisions

Revision	Date	Section	Page(s)	Summary of Changes	Author/Revised By:
1.0	08/04/2016	All	All	Version 1.0	Daniel Salinas
2.0	09/26/2016	All	All	Updated Report file name.	Daniel Salinas

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Test Report Attestation

Microsoft Corporation

Model: 1756

FCC ID: C3K 1756

IC ID: 3048A-1756

Applicable Standards

Specification	Test Result
FCC CFR47 Part 2.1093 ISED Canada RSS-102 Issue 5	Complies

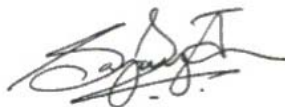
Microsoft EMC Laboratory attests that the product model identified in this report has been tested to and meets the requirements identified in the above standards. The test results in this report solely pertains to the specific sample tested, under the conditions and operating modes as provided by the customer.

This report shall not be used to claim product certification, approval, or endorsement by A2LA or any agency of any Government. Reproduction, duplication or publication of extracts from this test report requires prior written approval of Microsoft EMC Laboratory.

This report replaces the previously issued report #R-TR378-FCCIC-MPE-1 issued by Microsoft EMC Labs on 8/4/2016.



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Reviewed/ Approved by: Sajay Jose
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2 Product Description

Company Name:	Microsoft Corporation
Address:	One Microsoft Way
City, State, Zip:	Redmond, WA 98052-6399
Customer Contact:	Chaitrali Limaye
Functional Description of the EUT:	Wireless Input Accessory Device with BTLE Radio
Model:	1756
FCC ID:	C3K1756
IC ID:	3048A-1756
Radio Description:	Bluetooth LE
Frequency Range of Operation:	2.4 GHz- 2.4835 GHz
Antenna Info:	Internal Antenna Gain: +1.73 dBi (@2.4 GHz)
EUT Classification:	DTS
Equipment Design State:	Production Equivalent
Equipment Condition:	Good
RF Exposure Conditions:	Extremity Exposure, Body Exposure

3 Facilities and Accreditations

3.1 Test Facility

All 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 Average Conducted Output Power Measurements

4.1 Test Configuration

The EUT is pre-programmed to transmit continuously in BTLE mode at low/mid/high channels of the frequency band. The actual test mode is identified by the LED on the EUT.

Channel 0: Slow White LED blink.

Channel 19: Fast white LED blink.

Channel 39: Solid white LED blink.

4.2 Test Method- Average Power

(According to KDB 558074 Section 9.2.3.1)

Antenna port conducted measurements were performed on a bench-top setup consisting of an average power meter and pre-characterized RF cables.

Total Average Power (dBm)= Measured Average Power (dBm)+ DCF (dB)

EIRP (Effective Isotropic Radiated Power) is calculated based on the following formula:

$$EIRP (dBm) = Total Output Power (dBm) + Antenna Gain (dBi)$$

4.3 Test Equipment List

Manufacturer	Description	Model #	Asset #	Calibration Due
Rohde & Schwarz	Power Meter	NRP2	RF-237	4/14/2017
Rohde & Schwarz	Power Sensor	NRP-Z81	RF-282	4/12/2017

4.4 Test Results

Table 1: Average Power

Frequency (MHz)	Mode	Measured Average Power (dBm)	Measured Average Power (mW)	Maximum Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)
2402	GFSK	0.10	1.02	1.73	1.83	1.52
2440	GFSK	-0.04	0.99	1.73	1.69	1.48
2480	GFSK	0.06	1.01	1.73	1.79	1.51

Table 2: Max Average Power

Frequency (MHz)	Maximum manufacturer stated Average Power (adjusted for Tune up Tolerance) (dBm)	Maximum manufacturer stated Average Power (adjusted for Tune up Tolerance) (mW)	Maximum Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)
2402	1.8	1.51	1.73	3.53	2.25
2440	1.8	1.51	1.73	3.53	2.25
2480	1.8	1.51	1.73	3.53	2.25

5 SAR Test Exclusion

5.1 FCC

According to FCC KDB 447498 D01 General RF Exposure Guidance v06 (Oct 23, 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

$$\frac{(\text{Max.power of channel, including tune-up tolerance, mW})}{(\text{Min.test separation distance, mm})} X [\sqrt{f_{(\text{GHz})}}] \leq 3.0 \dots \dots \dots <\text{Eq. 1}>$$

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

Based on manufacturer declaration and when the minimum test separation distance is <5 mm, a distance of 5mm is applied to determine SAR test exclusion.

Frequency (MHz)	Average Output Power (dBm)	Average Output Power (mW)	SAR Exclusion Threshold using Eq. 1	SAR Exclusion Limit
2480	1.8	1.51	0.63	<3.0

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

5.2 ISED

For devices with a minimum separation distance of 5 mm SAR evaluation is exempt for transmitters operating with an output power < 4 mW at 2450 MHz (RSS-102 Table 1). EIRP is used to compare against the exclusion threshold.

Frequency (MHz)	Average Output Power (dBm)	Average Output Power (mW)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	SAR Exclusion Limit (mW)
2480	1.8	1.51	1.73	3.53	2.25	4

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

End of Report