



RF Exposure Evaluation Report

For

MODEL NO. 1754

FCC ID: C3K1754

IC ID: 3048A-1754

Test Report No. R-TR217-FCCIC-MPE-2

Issue Date: 14 January 2016

FCC CFR47 Part 2.1093

Industry Canada RSS-102: Issue 5

Prepared by

Microsoft EMC Laboratory

17760 NE 67th Ct,

Redmond WA, 98052, U.S.A.

425-421-9799

sajose@microsoft.com



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.....	7
6	SAR Test Exclusion	8
6.1	FCC	8
6.1.1	SAR Test Exclusion Criteria	8
6.1.2	FCC SAR Test Exclusion Evaluation	8
6.2	IC	8
6.2.1	SAR Test Exclusion Criteria	8
6.2.2	IC SAR Test Exclusion Evaluation	8

Test Report Attestation

Microsoft Corporation**Model:** 1754**FCC ID:** C3K 1754**IC ID:** 3048A-1754**Applicable Standards**

Specification	Test Result
RF Exposure requirements from: FCC CFR47 Part 2.1093 Industry 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 pertain to the specific sample tested, under the conditions and operating modes as provided by the customer.

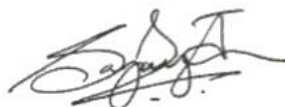
This report shall not be used to claim product certification, approval, or endorsement by A2LA or any agency of any Government.

Reproduction, duplication or publication of extracts from this test report requires prior written approval of Microsoft EMC Laboratory.

This document replaces the previously issued test report #R-TR217-FCCIC-MPE-1 issued by Microsoft EMC Labs on 12/28/2015.



Written By: Andy Shen
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:	Jennifer Liu
Functional Description of the EUT:	Wireless Input Device
Model:	1754
FCC ID:	C3K1754
IC ID:	3048A-1754
Radio Description:	BT LE (2402- 2480 MHz)
Declared Output Power:	-1dBm \pm 1dB
Modulation:	GFSK
Antenna Type and Gain:	Internal 3.68 dBi Gain
EUT Classification:	DTS
Equipment Design State:	EV2-Production equivalent Prototype FW0.99.14
Equipment Condition:	Good
Test Sample Details:	SN: 0001274547523 – Conducted SN: 0000725547523 – Radiated
RF Exposure Conditions:	Extremity Exposure, Body Exposure

4.1 Test Configurations

The EUT was preprogrammed to transmit continuously with a constant duty cycle on low, middle, and high channels. LEDs on the unit indicated the proper mode of operation.

White LED blink once: Low Channel 2402 MHz

White LED blink twice: Mid Channel 2440 MHz

White LED blink three times: High channel 2480 MHz

Yellow LED: Transmitter turn off

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.

The correction factors between the EUT and the Spectrum Analyzer is added internally in the Analyzer settings. The plots displayed accounts for these correction factors.

Spectrum Analyzer Settings:

Peak Power Measurements:

Method of KDB 558074.

RBW= 1 MHz

VBW= 3 MHz

Trace Mode= Peak Detector (Max Hold)

Sweep time= Auto

Span= 3 MHz

EIRP was calculated based on the following formula:

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

5.2 Test Equipment List

Manufacturer	Description	Model #	Asset #	Calibration Due
Agilent	Spectrum Analyzer	N9030A	EMC-605	06/15/2016

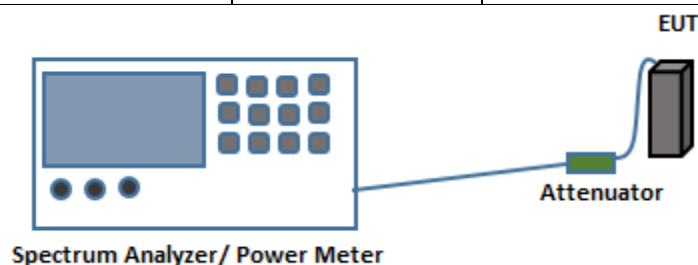


Fig.1. Test setup for antenna port conducted measurements

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	-0.178	0.959	3.68	3.50	2.24
2440	BTLE	-0.304	0.932	3.68	3.38	2.18
2480	BTLE	-0.519	0.887	3.68	3.16	2.07

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

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. The min. separation distance of 5mm is used for the calculation.

Frequency (MHz)	Max Peak Conducted Output Power, including Tolerance (mW)	Calculated SAR Exclusion Threshold	SAR Exclusion Limit	Result
2480	1	0.31	<3.0	SAR Test Not Required

6.2 IC

6.2.1 SAR Test Exclusion Criteria

For devices with a separation distance < 5 mm, SAR evaluation is exempt for transmitters operating with an output power < 4 mW at 2450 MHz (RSS-102 Table 1).

6.2.2 IC SAR Test Exclusion Evaluation

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

Frequency (MHz)	Max Peak Conducted Output Power, including Tolerance (mW)	Antenna Gain (dBi)	E.I.R.P (dBm)	E.I.R.P (mW)	SAR Exclusion Limit (mW)	Result
2402	1	3.68	3.68	2.33	4	SAR Test Not Required

End of Report