



RF Exposure Evaluation Report

For

MODEL NO. 1853
FCC ID: C3K1853
IC ID: 3048A-1853

Test Report No. S-174-FCCISED-SAR-1
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FCC CFR47 Part 2.1093
Industry Canada RSS-102: Issue 5

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425-421-9799





1 Record of Revisions

Revision	Date	Section	Page(s)	Summary of Changes	Author/Revised By:
1.0	08/27/2019	All	All	Version 1.0	Wei Sun

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Test Report Attestation

Microsoft Corporation

Model: 1853

FCC ID: C3K1853

IC ID: 3048A-1853

Applicable Standards


Specification	Test Result
FCC CFR47 Part 2.1093 Industry Canada RSS-102 Issue 5	Pass

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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Reviewed/ Issued By: Zack Gray
SAR Test Lead

2 Product Description

Company Name:	Microsoft Corporation
Address:	One Microsoft Way
City, State, Zip:	Redmond, WA 98052-6399
Customer Contact:	Wei Sun
Functional Description of the EUT:	Wireless Input Accessory Device
Model:	1853
FCC ID:	C3K1853
IC ID:	3048A-1853
Radio Description:	Bluetooth LE
Frequency Range of Operation:	2.4- 2.4835 GHz
Max Antenna Gain:	-2.41 dBi (2.4GHz)
EUT Classification:	DTS device
Equipment Design State:	Production
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 67th 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

5 SAR Test Exclusion

5.1 SAR Test Exclusion Criteria

The minimum separation distance of 5mm is used for the evaluation.

5.2 FCC

According to FCC KDB 447498 D01 General RF Exposure Guidance v06 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

5.2.1 FCC SAR Test Exclusion Evaluation

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

Frequency (GHz)	Output power including tune-up tolerance (dBm)	Output power including tune-up tolerance (mW)	Separation Distance (mm)	SAR Exclusion Calculation	SAR Exclusion Calculation Threshold	Result
2.48	-4.0	0.398	5	0.125	<3.0	SAR Testing Excluded

5.3 ISED

The SAR exclusion thresholds from RSS-102 Issue 5 are shown below.

Table 1: SAR evaluation – Exemption limits for routine evaluation based on frequency and separation distance^{4,5}

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of ≤5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
≤300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of 30 mm	At separation distance of 35 mm	At separation distance of 40 mm	At separation distance of 45 mm	At separation distance of ≥50 mm
≤300	223 mW	254 mW	284 mW	315 mW	345 mW
450	141 mW	159 mW	177 mW	195 mW	213 mW
835	80 mW	92 mW	105 mW	117 mW	130 mW
1900	99 mW	153 mW	225 mW	316 mW	431 mW
2450	83 mW	123 mW	173 mW	235 mW	309 mW
3500	86 mW	124 mW	170 mW	225 mW	290 mW
5800	56 mW	71 mW	85 mW	97 mW	106 mW

5.3.1 IC SAR Test Exclusion Evaluation

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

Table 3. SAR Test Exclusion

Frequency (GHz)	Separation Distance (mm)	Output power including tune-up tolerance (dBm)	Output power including tune-up tolerance (mW)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	SAR Exclusion Limit (mW)	Result
2.48	5	-4.0	0.395	-2.41	-6.41	0.229	4	SAR Testing Excluded

End of Report