



**FCC 47 CFR § 2.1093
INDUSTRY CANADA RSS 102 ISSUE 5**

RF EXPOSURE REPORT

FOR

WIRELESS INPUT DEVICE

MODEL NUMBER: 1697

FCC ID: C3K1697

IC ID: 3048A-1697

REPORT NUMBER: 15U20293-E6 Revision E

ISSUE DATE: May 14, 2015

Prepared for
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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	4/15/15	Initial Issue	F. de Anda
A	4/27/15	Updated 5 GHz ave power	F. de Anda
B	5/12/2015	Removed MPE calculations and updated SAR exclusion calculations	Dave Weaver
C	5/12/2015	Updated FCC and IC SAR Exclusion Calculations with 13mm separation distance	F. de Anda
D	5/13/2015	Updated FCC and IC SAR Exclusion Calculations with Tune-Up power numbers	F. de Anda
E	5/14/15	Updated EUT name	F. de Anda

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	4
2. TEST METHODOLOGY	5
3. REFERENCES	5
4. FACILITIES AND ACCREDITATION	5
5. STANDALONE SAR TEST EXCLUSION CONSIDERATIONS	6
5.1. FCC.....	6
5.2. INDUSTRY CANADA	7

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: MICROSOFT CORPORATION
ONE MICROSOFT WAY
REDMOND, WA 98052, U.S.A.

EUT DESCRIPTION: WIRELESS INPUT DEVICE

MODEL: 1697

SERIAL NUMBER: NA

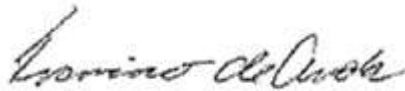
DATE TESTED: NA

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC 47 CFR § 2.1093 Published RF exposure KDB procedures	Exempt from SAR testing
INDUSTRY CANADA RSS 102 ISSUE 5	Exempt from SAR testing

UL Verification Services Inc. calculated the RF Exposure of the above equipment in accordance with the requirements set forth in the above standards, using test results reported in the test report documents referenced below and/or documentation furnished by the applicant. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations of these calculations. The results show that the equipment is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Verification Services Inc. By:



FRANCISCO DE ANDA
PROJECT LEAD
UL Verification Services Inc.

2. TEST METHODOLOGY

All calculations were made in accordance with FCC KDB 447498 or RSS-102 issue 5 for 10g extremity SAR.

3. REFERENCES

Maximum declared output power and antenna gain is provided by the applicant.

4. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/2000650.htm>.

5. STANDALONE SAR TEST EXCLUSION CONSIDERATIONS

5.1. FCC

SAR test exclusion in accordance with KDB 447498.

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [f(\text{GHz})] \leq 3.0$, for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, 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

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

SAR Exclusion Calculations Table for Portable Devices (separation distance $< 20\text{cm}$)

Antenna	Tx	Frequency (MHz)	Maximum Avg Output power (mW)	Separation distances (mm)	Calculated Threshold Value
WLAN Main	WiFi	2437	4.00	10	0.6
WLAN Main	WiFi	5825	4.00	10	1.0

Separation distance of 10mm was used based on drawing provided by manufacturer. See end of this report.

Conclusion:

The computed value is < 7.5 ; therefore, EUT qualifies for Standalone SAR test exclusion.

5.2. INDUSTRY CANADA

Industry Canada SAR exclusion limits are contained in RSS-102 issue 5. The SAR exclusion table from RSS-102 issue 5 is reproduced below:

Table 1: SAR evaluation - exemption limits for routine evaluation based on frequency and separation distance.

Frequency MHz	Exemption Limits (mW)				
	At separation distance of ≤5mm	At separation distance of 10mm	At separation distance of 15mm	At separation distance of 20mm	At separation distance of 25mm
≤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

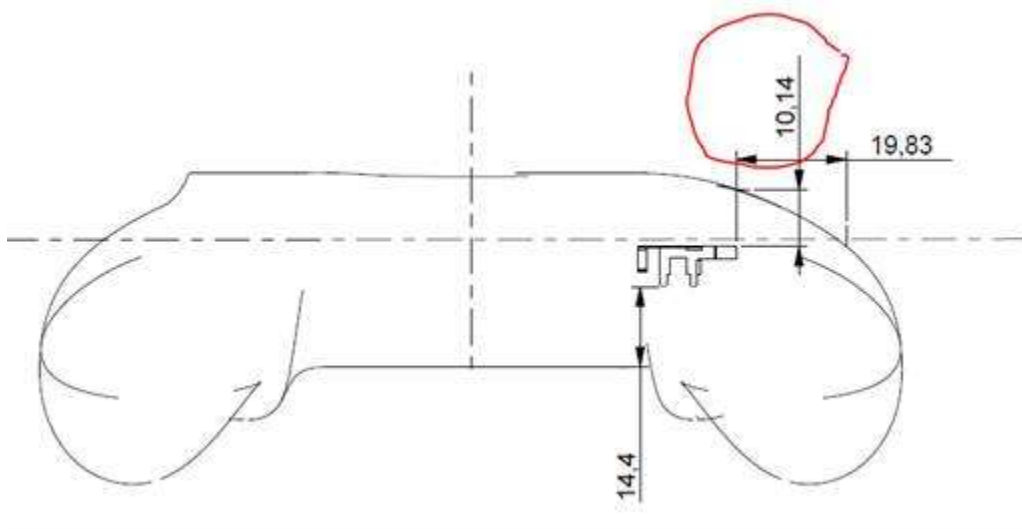
Frequency MHz	Exemption Limits (mW)				
	At separation distance of 30mm	At separation distance of 35mm	At separation distance of 40mm	At separation distance of 45mm	At separation distance of ≥50mm
≤300	223 mW	254 mW	284 mW	315 mW	345 mW
450	141 mW	159 mW	177 mW	195 mW	213 mW
835	80 mW	92 mW	105 mW	117 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

For handheld devices the exemption limit is multiplied by 2.5. Power used to determine exemption is the higher of the maximum declared conducted average power or EIRP.

Antenna	Tx	Frequency (MHz)	Max Avg Output power		Antenna Gain (dBi)	EIRP (mW)
			dBm	mW		
WLAN Main	WiFi	2437	6.50	4.00	-1.62	3.1
WLAN Main	WiFi	5825	6.50	4.00	1.62	6.5

The minimum antenna to user distance that will be encountered in normal use is 10mm(See drawing at the end of this report). Using the exclusion criteria for 10mm this results in an exemption limit of 17.5mW at 2450 MHz and 15mW at 5800 MHz.

As the maximum output power is 3.1mW conducted at 2.4GHz and 6.5mW EIRP at 5GHz the EUT qualifies for SAR test exclusion.



END OF REPORT