

Variant FCC SAR Exclusion Report

Report No. : SA190626D06A
Applicant : MICROSOFT CORPORATION
Address : ONE MICROSOFT WAY REDMOND, WA 98052-6399, U.S.A.
Product : Bluetooth Accessory
FCC ID : C3K1852
Brand : Microsoft
Model No. : 1852
Standards : FCC 47 CFR Part 2 (2.1093), IEEE C95.1:1992, IEEE Std 1528:2013
KDB 865664 D01 v01r04, KDB 865664 D02 v01r02, KDB 447498 D01 v06
Sample Received Date : Jun. 26, 2019
Date of Evaluation : Aug. 15, 2019
Lab Address : No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location : No. 19, Hwa Ya 2nd Rd, Wen Hwa Vil, Kwei Shan Dist., Taoyuan City 33383, Taiwan

CERTIFICATION: The above equipment have been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch–Lin Kou Laboratories**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's SAR characteristics under the conditions specified in this report. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by TAF or any government agencies.

This report is issued as a supplementary report to BV CPS report no.: SA190626D06-1. The difference compared with original report is increasing the output power of BT LE via software.

Prepared By :



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Approved By :



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FCC Accredited No.: TW0003

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Release Control Record

Report No.	Reason for Change	Date Issued
SA190626D06A	Initial release	Dec. 17, 2019

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1. Summary of Maximum SAR Value

Equipment Class	Mode	Highest SAR-1g Head (W/kg)
DSS	Bluetooth EDR	Not Required

Note:

1. The SAR criteria (**Head & Body: SAR-1g 1.6 W/kg, and Extremity: SAR-10g 4.0 W/kg**) for general population/uncontrolled exposure is specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992.

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2. Description of Equipment Under Test

EUT Type	Bluetooth Accessory
FCC ID	C3K1852
Brand Name	Microsoft
Model Name	1852
Tx Frequency Bands (Unit: MHz)	Bluetooth : 2402 ~ 2480
Uplink Modulations	Bluetooth : GFSK, $\pi/4$ -DQPSK, 8-DPSK
Maximum Tune-up Conducted Power (Unit: dBm)	Please refer to section 4.6.1 of this report
Antenna Type	PCB Antenna
EUT Stage	Engineering Sample

Note:

1. This report is issued as a supplementary report to BV CPS report no.: SA190626D06-1. The difference compared with original report is increasing the output power of BT LE via software. Therefore, the power table of BT LE is updated. And the power of BT LE is still lower than BT EDR, so the original evaluation of SAR exclusion is kept in this report.
2. The above EUT information is declared by manufacturer and for more detailed features description please refers to the manufacturer's specifications or User's Manual.

List of Accessory:

Battery	Brand Name	VARTA
	Model Name	CP1254
	Power Rating	3.7Vdc, 60mAh
	Type	Li-ion

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3. SAR Measurement Evaluation

3.1 Maximum Output Power

3.1.1 Maximum Target Conducted Power

The maximum conducted average power (Unit: dBm) including tune-up tolerance is shown as below.

<Bluetooth>

Mode	Channel	Frequency (MHz)	Tune-up Power
Bluetooth EDR	0	2402	9
	39	2441	9
	78	2480	9
Bluetooth LE	0	2402	5
	19	2440	5
	39	2480	5

3.1.2 Measured Conducted Power Result

The measuring conducted average power (Unit: dBm) is shown as below.

<Bluetooth>

Mode	Channel	Frequency (MHz)	Average Power
Bluetooth EDR	0	2402	8.71
	39	2441	8.68
	78	2480	8.89
Bluetooth LE	0	2402	4.59
	19	2440	4.57
	39	2480	4.52

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4.1 SAR Testing Exclusions

According to KDB 447498 D01, the SAR test exclusion condition is based on source-based time-averaged maximum conducted output power, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions. The SAR exclusion threshold is determined by the following formula.

- For the test separation distance ≤ 50 mm

$$\frac{\text{Max. Tune up Power}_{(\text{mW})}}{\text{Min. Test Separation Distance}_{(\text{mm})}} \times \sqrt{f_{(\text{GHz})}} \leq 3.0$$

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

- For the test separation distance > 50 mm, and the frequency at 100 MHz to 1500 MHz

$$\left[(\text{Threshold at 50 mm in Step 1}) + (\text{Test Separation Distance} - 50 \text{ mm}) \times \left(\frac{f_{(\text{MHz})}}{150} \right) \right]_{(\text{mW})}$$

- For the test separation distance > 50 mm, and the frequency at > 1500 MHz to 6 GHz

$$[(\text{Threshold at 50 mm in Step 1}) + (\text{Test Separation Distance} - 50 \text{ mm}) \times 10]_{(\text{mW})}$$

Mode	Max. Tune-up Power (dBm)	Max. Tune-up Power (mW)	Rear Face			Left Side			Right Side			Top Side			Bottom Side		
			Ant. to Surface (mm)	Calculated Result	Require SAR Testing?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing?	Ant. to Surface (mm)	Calculated Result	Require SAR Testing?
BT	9	8	17.76	0.71	No	12.5	1.01	No	12.5	1.01	No	2.45	2.52	No	22.55	0.56	No

Note:

- When separation distance ≤ 50 mm and the calculated result shown in above table is ≤ 3.0 , the SAR testing exclusion is applied.
- When separation distance > 50 mm and the device output power is less than the calculated result (power threshold, mW) shown in above table, the SAR testing exclusion is applied.

Summary:

Since the SAR testing for all device orientations apply SAR test exclusion per KDB 447498, SAR testing for this device is not required.

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4. Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Taiwan HwaYa EMC/RF/Safety Lab:

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The road map of all our labs can be found in our web site also.

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Appendix A. Photographs of EUT and Setup

The setup photographs for SAR testing are shown as follows.