

# FCC SAR Exclusion Report

Report No. : SF200117C14  
Applicant : Nuheara Limited  
Address : 190 Aberdeen St, Northbridge, Western Australia 6003  
Product : IQbuds<sup>2</sup> Max  
Brand : Nuheara Limited  
FCC ID : 2AKMG00000NU318  
Model No. : NU318  
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 : Jan. 17, 2020  
Date of Evaluation : Mar. 06, 2020  
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, 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.

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## Release Control Record

Issue No.	Reason for Change	Date Issued
SF200117C14	Initial release	Mar. 10, 2020

## FCC SAR Exclusion Report

### 1. Summary of Maximum SAR Value

Equipment Class	Mode	Highest Reported SAR <sub>1g</sub> (W/kg)
DSS	Bluetooth	Not Required

**Note:**

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

## 2. Description of Equipment Under Test

<b>EUT Type</b>	IQbuds <sup>2</sup> Max
<b>Brand Name</b>	Nuheara Limited
<b>FCC ID</b>	2AKMG00000NU318
<b>Model Name</b>	NU318
<b>Tx Frequency Bands (Unit: MHz)</b>	Bluetooth : 2402 ~ 2480
<b>Uplink Modulations</b>	Bluetooth : GFSK, $\pi/4$ -DQPSK, 8-DPSK
<b>Maximum Tune-up Conducted Power (Unit: dBm)</b>	Please refer to section 3.1 of this report
<b>Antenna Type</b>	PIFA Antenna
<b>EUT Stage</b>	Engineering Sample

**Note:**

1. 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.
2. Only left earbud has RF function.

### 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>

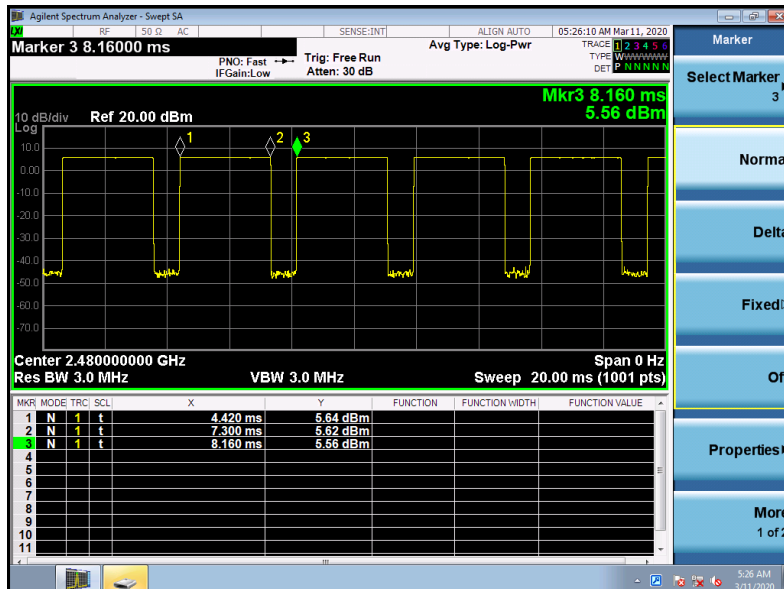
Mode	Channel	Frequency (MHz)	Tune-up Power
Bluetooth EDR	0	2402	6.5
	39	2441	6.5
	78	2480	6.5
Bluetooth LE	0	2402	3.5
	19	2440	3.5
	39	2480	3.5

##### 3.1.2 Time-Avg. Power calculation.

The calculation of time-avg. power (Unit: dBm) Including duty cycle.

<The calculated average power with duty cycle>

Mode	Max Tune-up Power	Duty cycle (%)	Calculated Time-Avg. Power
BT EDR	6.5	77.0	5.36



Time-domain plot for Bluetooth transmission signal

The duty factor of Bluetooth signal has been calculated as following.

$$\text{Duty Factor} = \text{Pulse Width} / \text{Total Period} = ( 7.30 - 4.42 ) / ( 8.16 - 4.42 ) = 77 \%$$

## 3.2 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  $\leq 50$  mm

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

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

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

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

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

Mode	Time-Avg. Power (dBm)	Time-Avg. Power (mW)	Separation Distance (mm)		
			Ant. to Surface (mm)	Calculated Result	Require SAR Testing?
BT	5.36	3.44	5	1.08	No

### Note:

- When separation distance  $\leq 50$  mm and the calculated result shown in above table is  $\leq 3.0$ , 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.
- Please refer distance a and b on antenna location in appendix a.

### Summary:

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

### 4. Information on 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:

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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**