

# SAR TEST EXCLUSION EVALUATION REPORT

**Product Name:** Wireless Sport Earbuds  
**Trade Mark:** INSIGNIA  
**Model No.:** NS-AHBTSPORT2  
**HVIN:** NSAHBT2  
**Report Number:** 180207001RFC-2  
**Test Standards:** FCC 47 CFR Part 2.1093  
RSS-102 Issue 5  
**FCC ID:** 2ALVK-NSAHBT2  
**IC:** 11136A-NSAHBT2  
**Test Result:** PASS  
**Date of Issue:** March 6, 2018

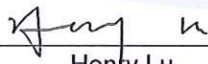
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## 1. GENERAL INFORMATION

### 1.1 CLIENT INFORMATION

|                                 |                                                                                                   |
|---------------------------------|---------------------------------------------------------------------------------------------------|
| <b>Applicant:</b>               | Cosonic Intelligent Technologies Co.,Ltd.                                                         |
| <b>Address of Applicant:</b>    | 5th Floor,1st Building,No.6 South Industry Road Songshan Lake Hi-tech Industrial Development Zone |
| <b>Manufacturer:</b>            | Cosonic Intelligent Technologies Co.,Ltd.                                                         |
| <b>Address of Manufacturer:</b> | 5th Floor,1st Building,No.6 South Industry Road Songshan Lake Hi-tech Industrial Development Zone |

### 1.2 EUT INFORMATION

|                               |                        |                    |
|-------------------------------|------------------------|--------------------|
| <b>Product Name:</b>          | Wireless Sport Earbuds |                    |
| <b>Model No.:</b>             | NS-AHBTSPORT2          |                    |
| <b>Trade Mark:</b>            | INSIGNIA               |                    |
| <b>DUT Stage:</b>             | Identical Prototype    |                    |
| <b>EUT Supports Function:</b> | 2.4 GHz ISM Band:      | Bluetooth V4.1+EDR |

### 1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

|                              |                                         |
|------------------------------|-----------------------------------------|
| <b>Frequency Range:</b>      | 2402 MHz to 2480 MHz                    |
| <b>Bluetooth Version:</b>    | Bluetooth V4.1+EDR                      |
| <b>Modulation Technique:</b> | Frequency Hopping Spread Spectrum(FHSS) |
| <b>Type of Modulation:</b>   | GFSK, $\pi/4$ DQPSK, 8DPSK              |
| <b>Number of Channels:</b>   | 79                                      |
| <b>Channel Separation:</b>   | 1 MHz                                   |
| <b>Antenna Type:</b>         | Ceramic Antenna                         |
| <b>Antenna Gain:</b>         | 2.5 dBi                                 |
| <b>Maximum Peak Power:</b>   | 4.53 dBm                                |

## 1.4 OTHER INFORMATION

| Mode                             | Tx/Rx Frequency      | Test RF Channel Lists |            |            |
|----------------------------------|----------------------|-----------------------|------------|------------|
|                                  |                      | Lowest(L)             | Middle(M)  | Highest(H) |
| GFSK<br>(DH1, DH3, DH5)          | 2402 MHz to 2480 MHz | Channel 0             | Channel 39 | Channel 78 |
|                                  |                      | 2402 MHz              | 2441 MHz   | 2480 MHz   |
| $\pi$ /4DQPSK<br>(DH1, DH3, DH5) | 2402 MHz to 2480 MHz | Channel 0             | Channel 39 | Channel 78 |
|                                  |                      | 2402 MHz              | 2441 MHz   | 2480 MHz   |
| 8DPSK<br>(DH1, DH3, DH5)         | 2402 MHz to 2480 MHz | Channel 0             | Channel 39 | Channel 78 |
|                                  |                      | 2402 MHz              | 2441 MHz   | 2480 MHz   |

## 1.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product, according to the specifications of the manufacturers. It must comply with the requirements of the following standards:

**FCC 47 CFR Part 2.1093**

**RSS-102 Issue 5**

All test items have been performed and recorded as per the above standards

## 1.6 DEVIATION FROM STANDARDS

None.

## 1.7 ABNORMALITIES FROM STANDARD CONDITIONS

None.

## 1.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

## 2. EQUIPMENT LIST

Please refer to the RF test report.

### 3. SAR TEST EXCLUSION EVALUATION

#### 3.1 REFERENCE DOCUMENTS FOR EVALUATION

| No. | Identity                                        | Document Title                                                                                 |
|-----|-------------------------------------------------|------------------------------------------------------------------------------------------------|
| 1   | FCC 47 CFR Part 2.1093                          | Radiofrequency radiation exposure evaluation: portable devices.                                |
| 2   | RSS-102 Issue 5                                 | Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands) |
| 3   | KDB 447498 D01 General RF Exposure Guidance v06 | RF EXPOSURE PROCEDURES AND EQUIPMENT AUTHORIZATION POLICIES FOR MOBILE AND PORTABLE DEVICES    |

#### 3.2 EXEMPTION LIMITS FOR ROUTINE EVALUATION – SAR EVALUATION

##### 3.2.1 SAR Test Exclusion Threshold

###### 3.2.1.1 KDB 447498 D01 v06

##### Appendix A

##### *SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm*

Approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances are illustrated in the following Table. The equation and threshold in 4.3.1 must be applied to determine SAR test exclusion.

| MHz  | 5  | 10 | 15  | 20  | 25  | mm                                       |
|------|----|----|-----|-----|-----|------------------------------------------|
| 150  | 39 | 77 | 116 | 155 | 194 | <i>SAR Test Exclusion Threshold (mW)</i> |
| 300  | 27 | 55 | 82  | 110 | 137 |                                          |
| 450  | 22 | 45 | 67  | 89  | 112 |                                          |
| 835  | 16 | 33 | 49  | 66  | 82  |                                          |
| 900  | 16 | 32 | 47  | 63  | 79  |                                          |
| 1500 | 12 | 24 | 37  | 49  | 61  |                                          |
| 1900 | 11 | 22 | 33  | 44  | 54  |                                          |
| 2450 | 10 | 19 | 29  | 38  | 48  |                                          |
| 3600 | 8  | 16 | 24  | 32  | 40  |                                          |
| 5200 | 7  | 13 | 20  | 26  | 33  |                                          |
| 5400 | 6  | 13 | 19  | 26  | 32  |                                          |
| 5800 | 6  | 12 | 19  | 25  | 31  |                                          |



| MHz  | 30  | 35  | 40  | 45  | 50  | mm                                      |
|------|-----|-----|-----|-----|-----|-----------------------------------------|
| 150  | 232 | 271 | 310 | 349 | 387 | SAR Test<br>Exclusion<br>Threshold (mW) |
| 300  | 164 | 192 | 219 | 246 | 274 |                                         |
| 450  | 134 | 157 | 179 | 201 | 224 |                                         |
| 835  | 98  | 115 | 131 | 148 | 164 |                                         |
| 900  | 95  | 111 | 126 | 142 | 158 |                                         |
| 1500 | 73  | 86  | 98  | 110 | 122 |                                         |
| 1900 | 65  | 76  | 87  | 98  | 109 |                                         |
| 2450 | 57  | 67  | 77  | 86  | 96  |                                         |
| 3600 | 47  | 55  | 63  | 71  | 79  |                                         |
| 5200 | 39  | 46  | 53  | 59  | 66  |                                         |
| 5400 | 39  | 45  | 52  | 58  | 65  |                                         |
| 5800 | 37  | 44  | 50  | 56  | 62  |                                         |

**Note:** 10-g Extremity SAR Test Exclusion Power Thresholds are 2.5 times higher than the 1-g SAR Test Exclusion Thresholds indicated above. These thresholds do not apply, by extrapolation or other means, to occupational exposure limits.

### 3.2.1.2 RSS-102 Issue 5

**Table 1: SAR evaluation – Exemption limits for routine evaluation based on frequency and separation distance<sup>4,5</sup>**

| 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                           |

4 The exemption limits in Table 1 are based on measurements and simulations of half-wave dipole antennas at separation distances of 5 mm to 25 mm from a flat phantom, providing a SAR value of approximately 0.4 W/kg for 1 g of tissue. For low frequencies (300 MHz to 835 MHz), the exemption limits are derived from a linear fit. For high frequencies (1900 MHz and above), the exemption limits are derived from a third order polynomial fit.

5 Transmitters operating between 0.003-10 MHz, meeting the exemption from routine SAR evaluation, shall

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demonstrate compliance to the instantaneous limits in Section 4.

### 3.2.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

## 3.3 MPE CALCULATION RESULTS

**Note:** For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

### 3.3.1 For BT

For BT function, operating at 2402MHz to 2480 MHz for GFSK,  $\pi/4$  DQPSK, 8DPSK

#### 3.3.1.1 Antenna Type:

Chain 0: Crystals Antenna

#### 3.3.1.2 Antenna Gain:

Chain 0: 2402MHz to 2480 MHz: 2.5 dBi

#### 3.3.1.3 Results for FCC 47 CFR Part 2.1093

| Operating Mode | Frequency | Maximum Conducted Peak Output Power |      | Separation Distance | SAR Test Exclusion Threshold |
|----------------|-----------|-------------------------------------|------|---------------------|------------------------------|
|                | (MHz)     | (dBm)                               | (mW) | (mm)                | (mW)                         |
| EDR            | 2402-2480 | 4.53                                | 2.84 | 5                   | 10                           |

So the transmitter complies with the RF exposure requirements and the SAR is not required.



## APPENDIX 1 PHOTOS OF TEST SETUP

N/A

## APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal Photos.

\*\*\* End of Report \*\*\*

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