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Report Template Version: V04

Report Template Revision Date: 2018-07-06

# RF Exposure Evaluation Report

**Report No.:** CQASZ20210600874E-02  
**Applicant:** Avantronics Limited  
**Address of Applicant:** The 4th Floor, Yuepeng Building, No.1019 Jiabin Rd, Luohu District, Shenzhen  
**Equipment Under Test (EUT):**  
**EUT Name:** Avantree Torpedo Plus  
**Test Model No.:** BTSP-006P  
**Model No.:** BTSP-006P  
**Brand Name:** Avantree  
**FCC ID:** WJ5-BTSP-006P  
**Standards:** 47 CFR Part 1.1307  
47 CFR Part 2.1093  
KDB447498D01 General RF Exposure Guidance v06  
**Date of Receipt:** 2021-06-17  
**Date of Test:** 2021-06-21 to 2021-07-08  
**Date of Issue:** 2021-07-20  
**Test Result:** PASS\*

\*In the configuration tested, the EUT complied with the standards specified above

**Tested By:** Lewis Zhou  
( Lewis Zhou )

**Reviewed By:** Jun Li  
( Jun Li )

**Approved By:** Jack ai  
( Jack ai )



## 1 Version

### Revision History Of Report

| Report No.           | Version | Description    | Issue Date |
|----------------------|---------|----------------|------------|
| CQASZ20210600874E-02 | Rev.01  | Initial report | 2021-07-20 |

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### 3 General Information

#### 3.1 Client Information

|                          |                                                                              |
|--------------------------|------------------------------------------------------------------------------|
| Applicant:               | Avantronics Limited                                                          |
| Address of Applicant:    | The 4th Floor, Yuepeng Building, No.1019 Jiabin Rd, Luohu District, Shenzhen |
| Manufacturer:            | Avantronics Limited                                                          |
| Address of Manufacturer: | The 4th Floor, Yuepeng Building, No.1019 Jiabin Rd, Luohu District, Shenzhen |
| Factory:                 | Avantronics Limited                                                          |
| Address of Factory:      | The 4th Floor, Yuepeng Building, No.1019 Jiabin Rd, Luohu District, Shenzhen |

#### 3.2 General Description of EUT

|                                  |                                                                                                                    |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------|
| Product Name:                    | Avantree Torpedo Plus                                                                                              |
| Model No.:                       | BTSP-006P                                                                                                          |
| Test Model No                    | BTSP-006P                                                                                                          |
| Trade Mark:                      | Avantree                                                                                                           |
| EUT Supports Radios application: | Bluetooth mode<br>2402-2480MHz                                                                                     |
| Hardware Version:                | V1.9                                                                                                               |
| Software Version:                | V1.1                                                                                                               |
| Sample Type:                     | <input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Fix Location |
| Power Supply:                    | lithium battery:<br>DC3.7V, 2200mAh, Charge by DC5.0V                                                              |

#### 3.3 General Description of BT

|                       |                                             |
|-----------------------|---------------------------------------------|
| Operation Frequency:  | 2402MHz~2480MHz                             |
| Bluetooth Version:    | V5.0                                        |
| Modulation Technique: | Frequency Hopping Spread Spectrum(FHSS)     |
| Modulation Type:      | GFSK, $\pi/4$ DQPSK, 8DPSK                  |
| Number of Channel:    | 79                                          |
| Transfer Rate:        | 1Mbps/2Mbps/3Mbps                           |
| Hopping Channel Type: | Adaptive Frequency Hopping systems          |
| Test Software of EUT: | CSR BlueSuite 2.5.8 (manufacturer declare ) |
| Antenna Type:         | PCB antenna                                 |
| Antenna Gain:         | 0dBi                                        |

## 4 SAR Evaluation

### 4.1 RF Exposure Compliance Requirement

#### 4.1.1 Standard Requirement

According to KDB447498D01 General RF Exposure Guidance v06

##### 4.3.1. Standalone SAR test exclusion considerations

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied.

#### 4.1.2 Limits

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

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

$f(\text{GHz})$  is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation<sup>17</sup>

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  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

### 4.1.3 EUT RF Exposure

#### 1) For BT

#### Measurement Data

| GFSK mode        |                            |                            |                       |       |
|------------------|----------------------------|----------------------------|-----------------------|-------|
| Test channel     | Peak Output Power<br>(dBm) | Tune up tolerance<br>(dBm) | Maximum tune-up Power |       |
|                  |                            |                            | (dBm)                 | (mW)  |
| Lowest(2402MHz)  | -3.650                     | -4±1                       | -3                    | 0.501 |
| Middle(2441MHz)  | 2.250                      | 2±1                        | 3                     | 1.995 |
| Highest(2480MHz) | 2.970                      | 2±1                        | 3                     | 1.995 |
| π/4DQPSK mode    |                            |                            |                       |       |
| Test channel     | Peak Output Power<br>(dBm) | Tune up tolerance<br>(dBm) | Maximum tune-up Power |       |
|                  |                            |                            | (dBm)                 | (mW)  |
| Lowest(2402MHz)  | -2.490                     | -3±1                       | -2                    | 0.631 |
| Middle(2441MHz)  | 0.040                      | 0±1                        | 1                     | 1.259 |
| Highest(2480MHz) | 0.790                      | 0±1                        | 1                     | 1.259 |
| 8DPSK mode       |                            |                            |                       |       |
| Test channel     | Peak Output Power<br>(dBm) | Tune up tolerance<br>(dBm) | Maximum tune-up Power |       |
|                  |                            |                            | (dBm)                 | (mW)  |
| Lowest(2402MHz)  | -2.110                     | -3±1                       | -2                    | 0.631 |
| Middle(2441MHz)  | 0.410                      | 0±1                        | 1                     | 1.259 |
| Highest(2480MHz) | 1.190                      | 1±1                        | 2                     | 1.585 |

| Channel                                                 | Maximum Peak<br>Conducted<br>Output Power<br>(dBm) | Tune up<br>tolerance<br>(dBm) | Maximum tune-<br>up Power |       | Calculated<br>value | Exclusion<br>threshold |
|---------------------------------------------------------|----------------------------------------------------|-------------------------------|---------------------------|-------|---------------------|------------------------|
|                                                         |                                                    |                               | (dBm)                     | (mW)  |                     |                        |
| Lowest<br>(2402MHz)                                     | -2.110                                             | -3±1                          | -2                        | 0.631 | 0.196               | 3.0                    |
| Middle<br>(2441MHz)                                     | 2.250                                              | 2±1                           | 3                         | 1.995 | 0.623               |                        |
| Highest<br>(2480MHz)                                    | 2.970                                              | 2±1                           | 3                         | 1.995 | 0.628               |                        |
| Conclusion: the calculated value ≤3.0, SAR is exempted. |                                                    |                               |                           |       |                     |                        |

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20210600874E-01