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# RF Exposure Evaluation Report

**Report No.:** CQASZ20200901056E-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 Ensemble  
**Model No.:** BTHS-AS50  
**Brand Name:** Avantree  
**FCC ID:** WJ5-BTHS-AS50  
**Standards:** 47 CFR Part 1.1307  
47 CFR Part 2.1093  
KDB447498D01 General RF Exposure Guidance v06  
**Date of Receipt:** 2020-09-17  
**Date of Test:** 2020-09-17 to 2020-10-09  
**Date of Issue:** 2020-10-09  
**Test Result:** **PASS\***

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

**Tested By:** Martin Lee  
( Martin Lee )

**Reviewed By:** Sheek Luo  
( Sheek Luo )

**Approved By:** Jack Ai  
( Jack Ai )



## 1 Version

### Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20200901056E-02	Rev.01	Initial report	2020-10-09

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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

#### 3.2 General Description of EUT

Product Name:	Avantree Ensemble
Model No.:	BTBS-AS50
Trade Mark:	Avantree
Hardware Version:	V02
Software Version:	V017
Operation Frequency:	2402MHz~2480MHz
Bluetooth Version:	V5.0
Modulation Technique:	Frequency Hopping Spread Spectrum(FHSS)
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Transfer Rate:	1Mbps/2Mbps/3Mbps
Number of Channel:	79
Hopping Channel Type:	Adaptive Frequency Hopping systems
Product Type:	<input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Fix Location
Test Software of EUT:	Blue test 3 (manufacturer declare)
Antenna Type:	Internal PCB Antenna
Antenna Gain:	1.8dBi
Power Supply:	lithium battery:DC3.7V, 500mAh, Charge by DC5V

## 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:

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

f(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 (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	0.830	0±1	1.0	1.259
Middle(2441MHz)	2.920	2.0±1	3.0	1.995
Highest(2480MHz)	1.530	1.0±1	2.0	1.585
π/4DQPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-2.210	-3.0±1	-2.0	0.631
Middle(2441MHz)	0.360	-0.5±1	0.5	1.122
Highest(2480MHz)	-0.480	-1±1	0	1.000
8DPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-1.890	-2.5±1	-1.5	0.708
Middle(2441MHz)	0.830	0±1	1	1.259
Highest(2480MHz)	0.010	-0.5±1	0.5	1.122

Worst case: GFSK						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	0.830	0±1	1.0	1.259	0.390	3.0
Middle (2441MHz)	2.920	2.0±1	3.0	1.995	0.623	
Highest (2480MHz)	1.530	1.0±1	2.0	1.585	0.499	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20200901056E-01