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# RF Exposure Evaluation Report

**Report No.:** CQASZ20211001737E-03  
**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 Ace 130  
**Model No.:** BTHS-TWS130  
**Test Model No.:** BTHS-TWS130  
**Brand Name:** Avantree  
**FCC ID:** WJ5-BTHS-TWS130  
**Standards:** 47 CFR Part 1.1307  
47 CFR Part 2.1093  
KDB447498D01 General RF Exposure Guidance v06  
**Date of Receipt:** 2021-10-08  
**Date of Test:** 2021-10-08 to 2022-01-11  
**Date of Issue:** 2022-01-25  
**Test Result:** **PASS\***

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

**Tested By:** Lewis Zhou

( Lewis Zhou )

**Reviewed By:** Rock Huang

( Rock Huang )

**Approved By:** Jack Ai

( Jack Ai )



## 1 Version

### Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20211001737E-03	Rev.01	Initial report	2022-01-25

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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 Ace 130
Model No.:	BTHS-TWS130
Test Model No.:	BTHS-TWS130
Trade Mark:	Avantree
Software Version:	V3.01
Hardware Version:	1.0
Power Supply:	earphone: 3.7V 60mAh 0.222Wh charging compartment: 3.7V 580mAh 0.96Wh, Charge by DC 5V for adapter

#### 3.3 General Description of BLE

Operation Frequency:	2402MHz~2480MHz
Modulation Type:	GFSK
Transfer Rate:	1Mbps/2Mbps
Number of Channel:	40
Product Type:	<input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Fix Location
Antenna Type:	Chip antenna
Antenna Gain:	2.2dBi

#### 3.4 General Description of BT

Operation Frequency:	2402MHz~2480MHz
Modulation Type:	GFSK, $\pi/4$ DQPSK, 8DPSK
Transfer Rate:	1Mbps/2Mbps/3Mbps
Number of Channel:	79
Product Type:	<input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable <input type="checkbox"/> Fix Location
Antenna Type:	Chip antenna
Antenna Gain:	2.2dBi

## 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:

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

##### Measurement Data

GFSK mode (1Mbps)				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-1.52	-1.5±1	-0.5	0.891
Middle(2440MHz)	-0.59	-1±1	0	1
Highest(2480MHz)	0.41	0±1	1	1.259
GFSK mode (2Mbps)				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	-1.33	-1.5±1	-0.5	0.891
Middle(2440MHz)	-0.42	-1±1	0	1
Highest(2480MHz)	0.56	0±1	1	1.259

Worst case: GFSK mode (2Mbps)						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	-1.33	-1.5±1	-0.5	0.891	0.276	3.0
Middle (2440MHz)	-0.42	-1±1	0	1	0.312	
Highest (2480MHz)	0.56	0±1	1	1.259	0.396	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20211001737E-01 BT can not simultaneous transmitting at same time.

2) For BT

Measurement Data

GFSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	1.210	1±1	2	1.585
Middle(2441MHz)	2.030	2±1	3	1.995
Highest(2480MHz)	3.050	3±1	4	2.512
π/4DQPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	0.680	0±1	1	1.259
Middle(2441MHz)	1.470	1±1	2	1.585
Highest(2480MHz)	2.520	2±1	3	1.995
8DPSK mode				
Test channel	Peak Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2402MHz)	0.820	0±1	1	1.259
Middle(2441MHz)	1.780	1±1	2	1.585
Highest(2480MHz)	2.920	2±1	3	1.995

Worst case: GFSK mode						
Channel	Maximum Peak Conducted Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power		Calculated value	Exclusion threshold
			(dBm)	(mW)		
Lowest (2402MHz)	1.210	1±1	2	1.585	0.491	3.0
Middle (2441MHz)	2.030	2±1	3	1.995	0.623	
Highest (2480MHz)	3.050	3±1	4	2.512	0.791	
Conclusion: the calculated value ≤3.0, SAR is exempted.						

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20211001737E-02 BLE can not simultaneous transmitting at same time.

\*\*\* END OF REPORT \*\*\*