



## SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

SZEMC-TRF-01 Rev. A/1

Report No.: SZCR250100016004

Page: 1 of 8

# RF EXPOSURE EVALUATION REPORT

**Application No.:** SZCR2501000160AT  
**Applicant:** Avantronics Limited  
**Address of Applicant:** The 4th Floor, Yuepeng Building, No.1019 Jiabin Rd, Luohu District, Shenzhen 518002 China  
**Manufacturer:** Avantronics Limited  
**Address of Manufacturer:** The 4th Floor, Yuepeng Building, No.1019 Jiabin Rd, Luohu District, Shenzhen 518002 China  
**Equipment Under Test (EUT):**  
**EUT Name:** Voyager  
**Model No.:** BTTC-228, BTTC-228-BLK, BTTC-228-BLU, BTTC-228-GRY, BTTC-228-SLV, BTTC-228P ♣  
♣ Please refer to section 3 of this report which indicates which model was actually tested and which were electrically identical.  
**Trade Mark:** Avantree  
**FCC ID:** WJ5-BTTC-228  
**Standard(s) :** 47 CFR PART 1, Subpart I, Section 1.1310  
47 CFR PART 2, Subpart J, Section 2.1093  
KDB447498D01 General RF Exposure Guidance v06  
**Date of Receipt:** 2025-01-10  
**Date of Test:** 2025-01-13 to 2025-01-18  
**Date of Issue:** 2025-02-11

<b>Evaluation Result:</b>	<b>Pass*</b>
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\* In the configuration evaluated, the EUT complied with the standards specified above.

Keny Xu

Keny Xu  
EMC Laboratory Manager



SGS-CSTC Standards Technical Services Co., Ltd.  
Shenzhen Branch EMC Laboratory

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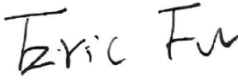
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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2025-02-11		Original

Authorized for issue by:				
				
		Bill Chen/Project Engineer		
				
		Eric Fu/Reviewer		

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## 3 General Information

### 3.1 General Description of E.U.T.

Product Type:	<input checked="" type="checkbox"/> Portable device
	<input type="checkbox"/> Mobile device
	<input type="checkbox"/> Fixed device

### 3.2 General Description of E.U.T.

Power supply:	Lithium Ion Battery: DC 3.7V 280mAh 1.036Wh rechargeable battery which charged by USB port
RF cable(Provided by the customer):	0.4dB
<b>For BT:</b>	
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.4 Dual mode
Modulation Type:	GFSK, pi/4DQPSK, 8DPSK
Number of Channels:	79
Channel Spacing:	1MHz
Spectrum Spread Technology:	Frequency Hopping Spread Spectrum(FHSS)
Antenna Type:	Chip Antenna
Antenna Gain:	0.24dBi
<b>For BLE:</b>	
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.4 Dual mode
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
Rate data:	1Mbps and 2Mbps
Antenna Type:	Chip Antenna
Antenna Gain:	0.24dBi

Remark:The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

### Declaration of EUT Family Grouping:

Model No.: BTTC-228, BTTC-228-BLK, BTTC-228-BLU, BTTC-228-GRY,  
BTTC-228-SLV, BTTC-228P

Only the model BTTC-228 was tested, since according to the declaration from the applicant, the electrical circuit design, PCB layout, components used and internal wiring and functions were identical for the above models, with only difference on color and model name.

### 3.3 Separation Distance

Minimum test separation distance:	5mm
Remark: This minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander.	



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### 3.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

### 3.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

#### • A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

#### • VCCI (Member No. 1937)

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

#### • FCC –Designation Number: CN1336

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

#### • Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

### 3.6 Deviation from Standards

None

### 3.7 Abnormalities from Standard Conditions

None



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## 4 Technical Requirements Specification

### 4.1 RF Exposure Evaluation

#### 4.1.1 Limit & Test Method

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:

$$\frac{[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})]}{[\sqrt{f(\text{GHz})}]} \leq 3.0$$
 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



## 4.1.2 Conclusion

### BT:

The Max. power (including tune-up tolerance) is 7.71 dBm on the highest channel 2.402 GHz (\*)  
7.71 dBm logarithmic terms convert to numeric result is nearly 5.90 mW

According to the formula, calculate the test exclusion thresholds:

$$\left[ \frac{\text{max. power of channel, including tune-up tolerance, mW}}{\text{min. test separation distance, mm}} \right] \cdot \sqrt{f(\text{GHz})}$$

$$\text{General RF Exposure} = (5.90 \text{ mW} / 5 \text{ mm}) \times \sqrt{2.402 \text{ GHz}} = 1.83 \quad (1)$$

SAR requirement:

$$S = 3.0 \quad (2)$$

$$(1) < (2)$$

So the SAR report is not required.

(\*) Max. power refer to RF Test Report SZCR250100016002

### BLE:

The Max. power (including tune-up tolerance) is 9.71 dBm on the highest channel 2.402 GHz (\*)  
9.71 dBm logarithmic terms convert to numeric result is nearly 9.35 mW

According to the formula, calculate the test exclusion thresholds:

$$\left[ \frac{\text{max. power of channel, including tune-up tolerance, mW}}{\text{min. test separation distance, mm}} \right] \cdot \sqrt{f(\text{GHz})}$$

$$\text{General RF Exposure} = (9.35 \text{ mW} / 5 \text{ mm}) \times \sqrt{2.402 \text{ GHz}} = 2.90 \quad (1)$$

SAR requirement:

$$S = 3.0 \quad (2)$$

$$(1) < (2)$$

So the SAR report is not required.

(\*) Max. power refer to RF Test Report SZCR250100016003

--End of the Report--