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

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SAR Evaluation Report

Application No.:	SZEM1804002691CR
Applicant:	Trek Bicycle Corporation
Address of Applicant:	801 West Madison Street Waterloo Wisconsin United States 53594
Manufacturer:	Trek Bicycle Corporation
Address of Manufacturer:	801 W. Madison St, Waterloo, WI 53594
Factory:	Eiso Enterprise Co Ltd
Address of Factory:	No. 2, Zhonghua Ln., Shanying Rd., Guishan, Taoyuan Taiwan
Equipment Under Test (EUT):	
EUT Name:	Flare RT/Ion 200 RT
Model No.:	Flare RT, Ion 200 RT ♣
♣	Please refer to section 4 of this report which indicates which model was actually tested and which were electrically identical.
Trade mark:	Flare RT, Ion 200 R
FCC ID:	2AHXD553852
Standards:	47 CFR Part 1.1307 47 CFR Part 2.1093 KDB447498D01 General RF Exposure Guidance v06
Date of Receipt:	2018-04-11
Date of Test:	2018-04-17 to 2018-04-25
Date of Issue:	2018-04-26
Test Result :	**PASS***

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

Keny Xu
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2018-04-26		Original

Authorized for issue by:				
				
		Moon Zhang /Project Engineer		
				
		Eric Fu /Reviewer		

3 Contents

4 General Information

4.1 General Description of EUT

Power supply:	INPUT: DC 5V Li-ion battery: DC 3.7V
USB cable:	20cm unshielded
Bluetooth LE:	
Frequency Range:	2402MHz to 2480MHz
Bluetooth Version:	V4.0 Bluetooth LE
Modulation Type:	GFSK
Number of Channels:	40
Antenna Configuration:	Single Transmitting
Antenna Type:	Chip Antenna
Antenna Gain:	-2dBi
ANT+	
Frequency:	2457MHz
Antenna Configuration:	Single Transmitting
Antenna Type:	Chip Antenna
Antenna Gain:	-2dBi
Number of Channels:	1
Modulation Type:	GFSK

Remark:

Model No.: Flare RT, Ion 200 RT

Only the model Flare RT was tested fully since the electrical circuit design, layout, components used, internal wiring and functions were identical for all the above models, with only difference as below:

two PCB's difference is only on the color and the firmwave control will not effect the RF transmit feature.

Ion 200 RT has a white LED while Flare RT has a red LED. The parts are specified in the Bill of Materials. There are minor firmware differences between the two products due to the different application as a bicycle headlight vs Taillight.

4.2 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, Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

4.3 Test Facility

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

• **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• **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**

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. 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: CN1178**

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

Designation Number: CN1178. Test Firm Registration Number: 406779.

• **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

4.4 Deviation from Standards

None.

4.5 Abnormalities from Standard Conditions

None.

4.6 Other Information Requested by the Customer

None.

5 SAR Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 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.

5.1.2 Limits

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

[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 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[17]

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 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

5.1.3 EUT RF Exposure

The Max. power (including tune-up tolerance) is	-6.58	dBm on the highest channel	2.48	GHz
-6.58 dBm logarithmic terms convert to numeric result is nearly 0.22 mW				
According to the formula. calculate the test exclusion thresholds:				
[(max. power of channel, including tune-up tolerance, mW)/				
(min. test separation distance, mm)] · [√f(GHz)]				
General RF Exposure = (0.22 mW / 5 mm) x √2.48 GHz = 0.07			(1)	
SAR requirement:				
S = 3.0			(2)	
(1) < (2)				
So the SAR report is not required.				

ANT+:

Antenna Gain: -2dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1 in linear scale.

The maximum field strength of the fundamental is 91.48dBuV/m @ 3m. According to KDB 412172, eirp = pt x gt = $(E \times d)^2/30$ = 0.042mW.

RF Exposure Evaluation Distance: 20cm

Frequency (MHz)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)	Limit	MPE Ratios	Result
2457	0.042	0.0001	1	0.0001	PASS

Note: Refer to report No. SZEM180400269104 for EUT test Max conducted power value.
So the SAR report is not required.

- End of the Report -