

TEST REPORT

Product : Ion Pro RT
Trade mark : **BONTRAGER**
Model/Type reference : 552373
Serial Number : N/A
Report Number : EED32M00014301
FCC ID : 2AHXD-552373
Date of Issue : Apr. 13, 2020
Test Standards : 47 CFR Part 15 Subpart C
Test result : PASS

Prepared for:

Trek Bicycle Corporation
801 West Madison Street, Waterloo WI 53594

Prepared by:

Centre Testing International Group Co., Ltd.
Hongwei Industrial Zone, Bao'an 70 District,
Shenzhen, Guangdong, China
TEL: +86-755-3368 3668
FAX: +86-755-3368 3385

Tested By:

mark.chen.

Compiled by:

Smile Zhong

Mark Chen

Smile Zhong

Reviewed by:

Ware Xin

Approved by:

Sam Chuang

Ware Xin

Sam Chuang

Date:

Apr. 13, 2020

Check No.: 3336877703



2 Version

Version No.	Date	Description
00	Apr. 13, 2020	Original

3 Test Summary

Test Item	Test Requirement	Test method	Result
Radiated Spurious Emissions	47 CFR Part 15 Subpart C Section 15.205/15.209	ANSI C63.10-2013	PASS

Remark:

Test according to ANSI C63.4-2014 & ANSI C63.10-2013.

The tested sample(s) and the sample information are provided by the client.

This test report (Ref. No.:EED32M00014301) is only valid with the original test report (Ref. No.: EED32K00141201).

Review this report and original report, this report only replaces the battery

Therefore in this report the Radiated spurious below 1G were retested and shown the data in this report, other tests data please refer to original report No.EED32k00141201.

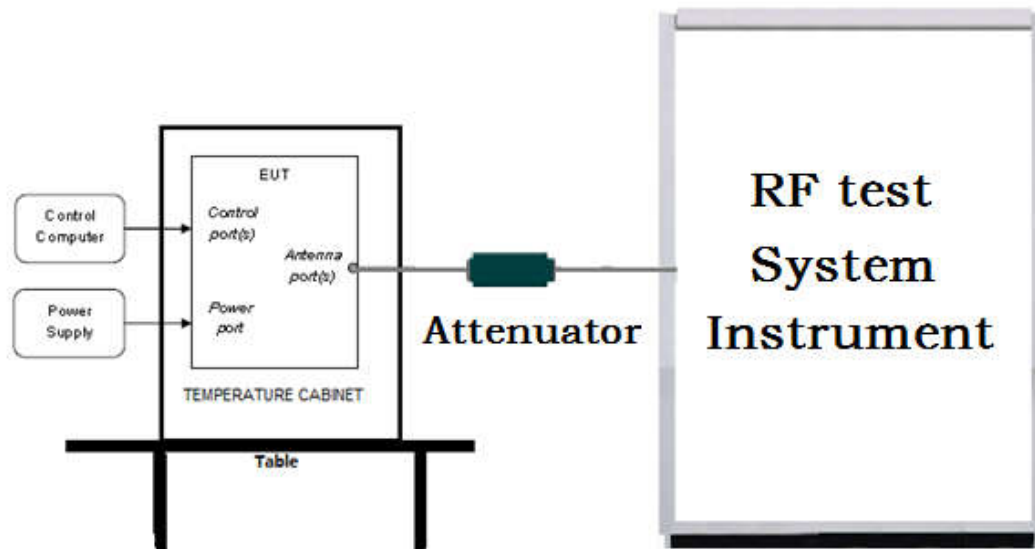
4 Content

1 COVER PAGE	1
2 VERSION	2
3 TEST SUMMARY	3
4 CONTENT	4
5 TEST REQUIREMENT	5
5.1 TEST SETUP	5
5.1.1 For Conducted test setup	5
5.1.2 For Radiated Emissions test setup	5
5.1.3 For Conducted Emissions test setup	6
5.2 TEST ENVIRONMENT	6
5.3 TEST CONDITION	6
6 GENERAL INFORMATION	7
6.1 CLIENT INFORMATION	7
6.2 GENERAL DESCRIPTION OF EUT	7
6.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD	8
6.4 DESCRIPTION OF SUPPORT UNITS	9
6.5 TEST LOCATION	9
6.6 DEVIATION FROM STANDARDS	9
6.7 ABNORMALITIES FROM STANDARD CONDITIONS	9
6.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER	9
6.9 MEASUREMENT UNCERTAINTY (95% CONFIDENCE LEVELS, $k=2$)	9
7 EQUIPMENT LIST	10
8 RADIO TECHNICAL REQUIREMENTS SPECIFICATION	11
Appendix A): Radiated Spurious Emissions	12
PHOTOGRAPHS OF TEST SETUP	14
PHOTOGRAPHS OF EUT CONSTRUCTIONAL DETAILS	15

5 Test Requirement

5.1 Test setup

5.1.1 For Conducted test setup



5.1.2 For Radiated Emissions test setup

Radiated Emissions setup:

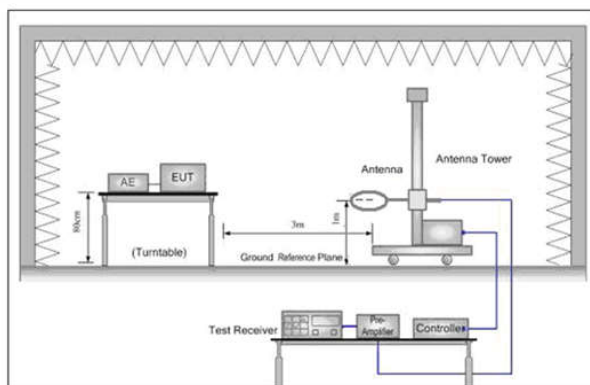


Figure 1. Below 30MHz

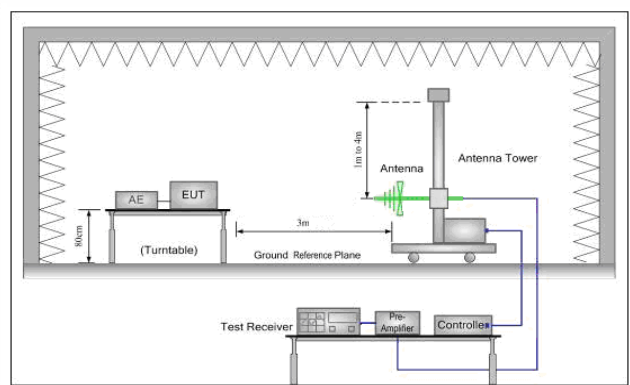


Figure 2. 30MHz to 1GHz

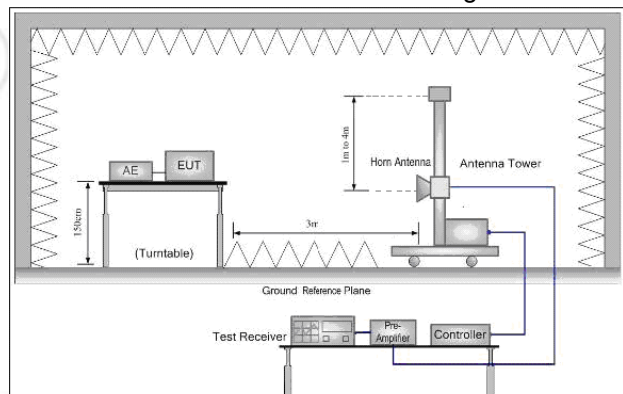
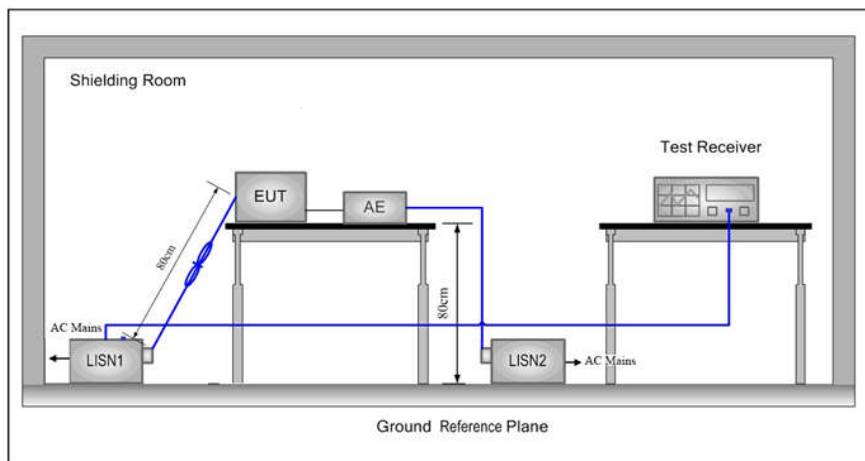


Figure 3. Above 1GHz

5.1.3 For Conducted Emissions test setup

Conducted Emissions setup



5.2 Test Environment

Operating Environment:	
Temperature:	23 °C
Humidity:	54 % RH
Atmospheric Pressure:	1010mbar

5.3 Test Condition

Test channel:

Test Mode	Tx/Rx	RF Channel		
		Low(L)	Middle(M)	High(H)
GFSK	2402MHz ~2480 MHz	Channel 1	Channel 20	Channel 40
		2402MHz	2440MHz	2480MHz
Transmitting mode:	The EUT transmitted the continuous signal at the specific channel(s).			

6 General Information

6.1 Client Information

Applicant:	Trek Bicycle Corporation
Address of Applicant:	801 West Madison Street, Waterloo WI 53594
Manufacturer:	Trek Bicycle Corporation
Address of Manufacturer:	801 West Madison Street, Waterloo WI 53594
Factory:	EISO ENTERPRISE CO., LTD.
Address of Factory:	NO.2, JHONGHUA LANE, SHANYING RD., GUEISHAN DIST., TAOYUAN CITY 333, TAIWAN

6.2 General Description of EUT

Product Name:	Ion Pro RT
Model No.(EUT):	552373
Trade mark:	
EUT Supports Radios application:	BT 4.0 single mode, 2402-2480MHz
Power Supply:	Rechargeable Li-ion Battery Pack 21700 3.63V 4900mAh 17.787Wh DC 5V and AC 120V/60Hz
Sample Received Date:	Jan. 16, 2020
Sample tested Date:	Jan. 16, 2020 to Mar. 29, 2020

6.3 Product Specification subjective to this standard

Operation Frequency:	2402MHz~2480MHz						
Bluetooth Version:	4.0						
Modulation Technique:	DSSS						
Modulation Type:	GFSK						
Number of Channel:	40						
Test Power Grade:	N/A(manufacturer declare)						
Test Software of EUT:	nRFgo Studio.exe(manufacturer declare)						
Antenna Type:	Integral Antenna						
Antenna Gain:	-1.52 dBi						
Test Voltage:	AC 120V, 60Hz						
Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	11	2422MHz	21	2442MHz	31	2462MHz
2	2404MHz	12	2424MHz	22	2444MHz	32	2464MHz
3	2406MHz	13	2426MHz	23	2446MHz	33	2466MHz
4	2408MHz	14	2428MHz	24	2448MHz	34	2468MHz
5	2410MHz	15	2430MHz	25	2450MHz	35	2470MHz
6	2412MHz	16	2432MHz	26	2452MHz	36	2472MHz
7	2414MHz	17	2434MHz	27	2454MHz	37	2474MHz
8	2416MHz	18	2436MHz	28	2456MHz	38	2476MHz
9	2418MHz	19	2438MHz	29	2458MHz	39	2478MHz
10	2420MHz	20	2440MHz	30	2460MHz	40	2480MHz

6.4 Description of Support Units

The EUT has been tested with associated equipment below.

Associated equipment name		Manufacture	model	Serial number	Supplied by	Certification
AE1	AC adapter	Dongguan Aohai Power Technology Co.,Ltd	MDY-09-EB	—	CTI	FCC

6.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd.

Building C, Hongwei Industrial Park Block 70, Bao'an District, Shenzhen, China

Telephone: +86 (0) 755 3368 3668 Fax: +86 (0) 755 3368 3385

No tests were sub-contracted.

FCC Designation No.: CN1164

6.6 Deviation from Standards

None.

6.7 Abnormalities from Standard Conditions

None.

6.8 Other Information Requested by the Customer

None.

6.9 Measurement Uncertainty (95% confidence levels, k=2)

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.9×10^{-8}
2	RF power, conducted	0.31dB (30MHz-1GHz)
		0.57dB (1GHz-18GHz)
3	Radiated Spurious emission test	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-12.75GHz)
4	Conduction emission	3.6dB (9kHz to 150kHz)
		3.2dB (150kHz to 30MHz)
5	Temperature test	0.64°C
6	Humidity test	2.8%
7	DC power voltages	0.025%

7 Equipment List

3M Semi/full-anechoic Chamber					
Equipment	Manufacturer	Model No.	Serial Number	Cal. date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)
3M Chamber & Accessory Equipment	TDK	SAC-3	---	05-24-2019	05-23-2022
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-618	07-26-2019	07-25-2020
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-076	04-25-2018	04-24-2021
Receiver	R&S	ESCI7	100938-003	10-21-2019	10-20-2020
Multi device Controller	maturo	NCD/070/10711112	---	---	---
Temperature/Humidity Indicator	Shanghai qixiang	HM10	1804298	07-26-2019	07-25-2020
Cable line	Fulai(7M)	SF106	5219/6A	---	---
Cable line	Fulai(6M)	SF106	5220/6A	---	---
Cable line	Fulai(3M)	SF106	5216/6A	---	---
Cable line	Fulai(3M)	SF106	5217/6A	---	---

8 Radio Technical Requirements Specification

Reference documents for testing:

No.	Identity	Document Title
1	FCC Part15C	Subpart C-Intentional Radiators
2	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices

Test Results List:

Test Requirement	Test method	Test item	Verdict	Note
Part15C Section 15.205/15.209	ANSI C63.10	Restricted bands around fundamental frequency (Radiated Emission)	PASS	
Part15C Section 15.205/15.209	ANSI C63.10	Radiated Spurious Emissions	PASS	Appendix A)

Appendix A): Radiated Spurious Emissions

Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
Peak		1MHz	10Hz	Average	
Test Procedure:					
Below 1GHz test procedure as below:					
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.					
Above 1GHz test procedure as below:					
g. Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter(Above 18GHz the distance is 1 meter and table is 1.5 meter). h. Test the EUT in the lowest channel ,the middle channel ,the Highest channel i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is worse case. j. Repeat above procedures until all frequencies measured was complete.					
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBμV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
	Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.				

Radiated Spurious Emissions test Data:

Radiated Emission below 1GHz

Mode:		BLE GFSK Transmitting					Channel:		2440		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	36.5967	11.21	0.67	-31.38	35.34	15.84	40.00	24.16	Pass	H	PK
2	71.3261	8.75	0.97	-32.04	34.42	12.10	40.00	27.90	Pass	H	PK
3	208.8859	11.13	1.71	-31.94	41.98	22.88	43.50	20.62	Pass	H	PK
4	360.0270	14.52	2.27	-31.84	41.91	26.86	46.00	19.14	Pass	H	PK
5	649.9890	19.40	3.10	-32.07	39.77	30.20	46.00	15.80	Pass	H	PK
6	974.9715	22.55	3.75	-30.95	36.43	31.78	54.00	22.22	Pass	H	PK

Mode:		BLE GFSK Transmitting					Channel:		2440		
NO	Freq. [MHz]	Ant Factor [dB]	Cable loss [dB]	Pream gain [dB]	Reading [dBμV]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Result	Polarity	Remark
1	35.2385	10.78	0.65	-31.42	47.30	27.31	40.00	12.69	Pass	V	PK
2	53.2823	12.67	0.83	-32.01	38.94	20.43	40.00	19.57	Pass	V	PK
3	150.0010	7.55	1.45	-32.01	48.44	25.43	43.50	18.07	Pass	V	PK
4	195.0135	10.43	1.64	-31.94	44.87	25.00	43.50	18.50	Pass	V	PK
5	360.0270	14.52	2.27	-31.84	40.55	25.50	46.00	20.50	Pass	V	PK
6	974.9715	22.55	3.75	-30.95	36.93	32.28	54.00	21.72	Pass	V	PK

Note:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading - Correct Factor

Correct Factor = Preamplifier Factor - Antenna Factor - Cable Factor

2) Scan from 9kHz to 25GHz, the disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.