



Compliance Testing, LLC

Previously Flom Test Lab

EMI, EMC, RF Testing Experts Since 1963

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Test Report

Prepared for: ClimbTag LLC

Model: Climbtag

Description: RFID BLE wrist worn device for monitoring rock climbing activities

Serial Number: N/A

FCC ID: NANLO-CLIMBTAG10

To

FCC Part 15.225

Date of Issue: October 3, 2017

On the behalf of the applicant:

**ClimbTag LLC
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Attention of:

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**Kenneth Lee
Project Test Engineer**

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All results contained herein relate only to the sample tested



Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	September 30, 2017	Kenneth Lee	Original Document

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ILAC / A2LA

Compliance Testing, LLC, has been accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to the joint ISO-ILAC-IAF Communiqué dated January 2009).

The tests results contained within this test report all fall within our scope of accreditation, unless noted in the table below.

Please refer to <http://www.compliancetesting.com/labscope.html> for current scope of accreditation.

Testing Certificate Number: **2152.01**



FCC Site Reg. #349717

IC Site Reg. #2044A-2

Non-accredited tests contained in this report:

N/A

The applicant has been cautioned as to the following:

15.21 Information to User

The user's manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a) Special Accessories

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator the responsible part may employ other methods of ensuring that the special accessories are provided to the consumer, without an additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

Standard Test Conditions Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with ANSI C63.10-2013 and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104°F), unless the particular equipment requirements specified testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Measurement results, unless otherwise noted, are worst-case measurements.

Environmental Conditions		
Temperature (°C)	Humidity (%)	Pressure (mbar)
18-26	31-39	962-974

EUT Description

Model: Climbttag

Description: RFID BLE wrist worn device for monitoring rock climbing activities

Firmware: N/A

Software: N/A

Serial Number: N/A

Additional Information: None

EUT Operation during Tests

The EUT was set to transmit at the highest available output power.

Accessories: None

Cables: None

Modifications: None



Test Results Summary

Specification	Test Name	Pass, Fail, N/A	Comments
15.225(a)	Fundamental Field Strength	Pass	
15.225(b)(c)	Out of Band Spurious Emissions	Pass	
15.225(e)	Frequency Stability	Pass	
15.209, 15.225(d)	Radiated Emissions	Pass	
15.207	Conducted Powerline Emissions	N/A	EUT is a battery powered device

15.203: Antenna Requirement:

- ☒ The antenna is permanently attached to the EUT
- ☐ The antenna uses a unique coupling
- ☐ The EUT must be professionally installed
- ☐ The antenna requirement does not apply

Field Strength

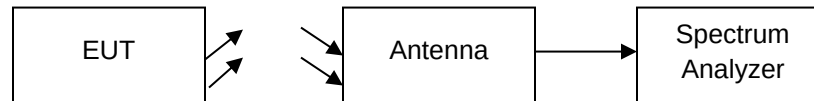
Engineer: Kenneth Lee

Test Date: 9/30/2017

Test Procedure

The EUT was tested in an anechoic chamber at a distance of 1 meter from the receiving loop antenna. A spectrum analyzer was used to verify that the EUT met the requirements for Fundamental Field Strength. The antenna correction and distance correction factors were summed with the quasi-peak measurement to ensure accurate readings were obtained. The following table indicates the highest emission in each of the indicated bands.

Test Setup



Field Strength

Frequency Band (MHz)	Measured Frequency (MHz)	Monitored Level (dBuV/m)	Distance CF (dB)	Antenna CF (dB)	Corrected Measurement (dBuV/m)	Limit (dBuV/m)	Result
13.110_13.410	13.2613	26.58	59.1	17	-15.52	40.51	Pass
13.410_13.553	13.5498	48.33	59.1	17	6.23	50.47	Pass
13.553_13.567	13.5595	61.02	59.1	17	18.92	84.00	Pass
13.567_13.710	13.5737	50.84	59.1	17	8.74	50.47	Pass
13.710_14.010	13.9274	27.35	59.1	17	-14.75	40.51	Pass

Note: Cable correction factors are not included in this measurement as the low loss of the high quality TWINAX cable at low frequencies is practically non-existent.



Frequency Stability

Engineer: Kenneth Lee

Test Date: 9/30/2017

Test Procedure

The EUT was placed in an environmental test chamber and a frequency counter was utilized to verify that the frequency stability met the requirement for frequency stability across the temperature range from -20°C to +50°C. A variable DC power supply was used to vary the voltage from 85% to 115% of the rated voltage.

Test Setup



Frequency Stability with Varying Voltage

Tuned Frequency (MHz)	Frequency Tolerance %	Upper Limit (MHz)	Lower Limit (MHz)	Nominal Voltage	Voltage	Measured Frequency (MHz)	Upper Margin (MHz)	Lower Margin (MHz)
13.56	0.0100	13.5609560	13.5582440	3.00	2.55	13.5595000	-0.0014560	0.0012560
		13.5609560	13.5582440		3.00	13.5597500	-0.0014560	0.0012560
		13.5609560	13.5582440		3.45	13.5593750	-0.0014560	0.0012560

Frequency Stability with Varying Temperature

Tuned Frequency (MHz)	Frequency Tolerance %	Upper Limit (MHz)	Lower Limit (MHz)	Temperature (C°)	Measured Frequency (MHz)	Upper Margin (MHz)	Lower Margin (MHz)
13.56	0.0100	13.5613560	13.5586440	-20	13.5596250	0.0017310	0.0009810
		13.5613560	13.5586440	-10	13.5595000	0.0018560	0.0008560
		13.5613560	13.5586440	0	13.5593750	0.0019810	0.0007310
		13.5613560	13.5586440	10	13.5595000	0.0018560	0.0008560
		13.5613560	13.5586440	20	13.5596250	0.0017310	0.0009810
		13.5613560	13.5586440	30	13.5596250	0.0017310	0.0009810
		13.5613560	13.5586440	40	13.5595000	0.0018560	0.0008560
		13.5613560	13.5586440	50	13.5595000	0.0018560	0.0008560



Radiated Emissions

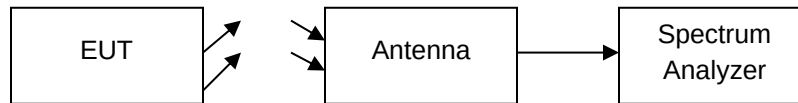
Engineer: Kenneth Lee

Test Date: 9/30/2017

Test Procedure

The EUT was tested in a semi-anechoic chamber at a distance of 3 meters from the receiving antenna. A spectrum analyzer was used to verify that the UUT met the requirements for Radiated Emissions. The spectrum for each tuned frequency was examined beyond the 10th harmonic.

Test Setup



Radiated Emissions

Emission Frequency (MHz)	Measured Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Antenna Polarity (V/H)	Turntable Position (deg)	Detector (QP,PK,Avg)
30.2368	27.238	40	-12.762	175	H	184	PK
132.797	22.473	43.5	-21.027	250	H	0	PK
259.266	24.843	46	-21.157	325	H	313	PK
421.860	28.733	46	-17.267	100	H	95	PK
41.368	23.139	40	-16.861	400	H	65	PK
36.631	25.283	40	-14.717	250	H	76	PK



Test Equipment Utilized

Description	Manufacturer	Model #	CT Asset #	Last Cal Date	Cal Due Date
Humidity / Temp Meter	Newport	IBTHX-W-5	i00282	6/9/17	6/9/18
Bi-Log Antenna	Schaffner	CBL 6111D	i00349	8/3/16	8/3/18
EMI Analyzer	Agilent	E7405A	i00379	2/22/17	2/22/18
3 Meter Semi-Anechoic Chamber	Panashield	3 Meter Semi-Anechoic Chamber	i00428	8/15/16	8/15/19
Spectrum Analyzer	Agilent	E4407B	i00331	10/19/16	10/19/17
Active Loop Antenna	EMCO	6507	i00326	9/29/17	9/29/19

In addition to the above listed equipment standard RF connectors and cables were utilized in the testing of the described equipment. Prior to testing these components were tested to verify proper operation.

END OF TEST REPORT