Test Report

Prepared for: Haven Lock Inc.

Model: Haven Connect

Description: Bluetooth Connected Smart Lock

Serial Number: N/A

FCC ID: 2ARFQHL1CNT001

To

FCC Part 1.1310

Date of Issue: October 25, 2018

On the behalf of the applicant:	**Haven Lock Inc.** **188 Front Street** **Suite 116-112** **Franklin, TN 37064**
Attention of:	**Alex Bertelli** **Ph: (615)478-4331** **Email: alex@havenlock.com**

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Poona Saber
Project Test Engineer

Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	October 15, 2018	Poona Saber	Original Document

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 joint ISO-ILAC-IAF Communiqué dated January 2009)

The tests results contained within this test report all fall within our scope of accreditation, unless 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

EUT Description
Model: Haven Connect
Description: Bluetooth Connected Smart Lock
Firmware: N/A
Software: N/A
Serial Number: N/A
Additional Information: EUT is a high-strength, Bluetooth enabled smart lock working with BLE technology at the frequency range of 2402-2480 MHz. The HLU board inside of the smart lock is tested at low, mid and high frequencies and controlled through an interface UART PCB board plus a debugger with a smart RF flash programmer to control the channels and power setting.

Source Based Time Averaged Power Calculation

Average Power calculations

Average Power = Peak Power * duty-cycle%

Tuned Frequency (MHz)	Conducted Peak Output Power (mW)	Duty Cycle (%)	Average Power (mW)
2402	2.8	100	2.8

MPE Evaluation

This is a mobile device used in Uncontrolled Exposure environment.

Limits Uncontrolled Exposure 47 CFR 1.1310 Table 1, (B)	0.3-1.234 MHz:	Limit [mW/cm²] = 100
	1.34-30 MHz:	Limit [mW/cm²] = (180/f²)
	30-300 MHz:	Limit [mW/cm²] = 0.2
	300-1500 MHz:	Limit [mW/cm²] = f/1500
	1500-100,000 MHz	Limit [mW/cm²] = 1.0

Test Data

Test Frequency, MHz	2402
Power, Conducted, mW (P)	2.8
Antenna Gain Isotropic	1 dBi
Antenna Gain Numeric (G)	1.25
Antenna Type	Embedded Loop Chip Antenna
Distance (R)	20 cm

$$S = \frac{P * G}{4\pi r^2}$$
Power Density (S) mw/cm²

Power Density (S) =0.00069
Limit = (from above table) = 1

At Mobile applications the device can be installed at minimum distance of 20 cm from the user. At Fixed applications, per section below, device is excluded from SAR evaluation and can be installed at any distance.

This is for calculating a SAR exclusion per KDB 447498.

1) 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*)] · [$\sqrt{f_{(GHz)}}$] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR,[25] where

• $f_{(GHz)}$ is the RF channel transmit frequency in GHz
• Power and distance are rounded to the nearest mW and mm before calculation[26]
• The result is rounded to one decimal place for comparison
• 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

2.8/5 * ($\sqrt{2.4}$) =1.54 <3

END OF TEST REPORT