

## RF TEST REPORT

### No. 170301758SHA-001

Applicant : 7Hugs Labs  
21B Allee des Citeaux, Issy les Moulineaux,  
92130 France

Manufacturer : Technochina Industries(ShangHai) Co., Ltd  
152/1421 Zhuan Xing Dong Lu, Min hang District,  
ShangHai , China

Product Name : Sleep Tracker

Type/Model : SM01

**TEST RESULT : PASS**

#### SUMMARY

The equipment complies with the requirements according to the following standard(s):

**47CFR Part 15 (2016):** Radio Frequency Devices

**ANSI C63.10 (2013):** American National Standard for Testing Unlicensed Wireless Devices

**RSS-210 Issue 9 (August 2016):** Licence-exempt Radio Apparatus (All Frequency Bands):  
Category I Equipment

**RSS-Gen Issue 4 (November 2014):** General Requirements for Compliance of Radio  
Apparatus

Date of issue: April 28, 2017

Prepared by:



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Reviewed by:



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## **Description of Test Facility**

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## 1. General Information

### 1.1 Applicant Information

Applicant : 7Hugs Labs  
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92130 France  
Name of contact : Pierre Emerich  
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Fax : /  
Manufacturer : Technochina Industries(ShangHai) Co., Ltd  
152/1421 Zhuan Xing Dong Lu, Min hang District,  
ShangHai , China

### 1.2 Identification of the EUT

Product description : Sleep Tracker  
Type/model : SM01  
Description of EUT : The EUT is a sleep tracker which contains a 915MHz radio,  
and there have only one model, we tested it and listed the  
915MHz results in this report.  
Operation Frequency : 902 - 928 MHz  
Band  
Type of Modulation : 2FSK  
Channel Description : 1Channel at 915MHz  
Antenna Type : Internal  
Port identification : /  
Rating : 3V DC (CR2032 Energizer battery)  
Declared Temperature : 0°C ~ 45°C  
range  
Category of EUT : Class B  
EUT type : ☒ Table top ☐ Floor standing  
Sample received date : 2017.03.10  
Sample Identification : /  
No  
Date of test : 2017.03.10 ~ 2017.04.26

### **1.3 Mode of operation during the test / Test peripherals used**

Within this test report, EUT was tested with modulation and tested under its rating voltage and frequency.

Three axes (X, Y, Z) were observed while the test receiver worked as “max hold” continuously and the highest reading among the whole test procedure was recorded. Compare with the test results that Z axis is the worst case.

The EUT was set to work normal and as receiving and transmitting mode during test. No standby function.

Test Peripherals: NA

## 2. Test Specification

### 2.1 Instrument list

| Selected                            | Equipment     | Type            | Manu.     | Internal no. | Cal. Date  | Due date   |
|-------------------------------------|---------------|-----------------|-----------|--------------|------------|------------|
| <input checked="" type="checkbox"/> | EMI Receiver  | ESCS 30         | R&S       | EC 2107      | 2016/10/19 | 2017/10/18 |
| <input checked="" type="checkbox"/> | A.M.N.        | ESH2-Z5         | R&S       | EC 3119      | 2015/12/16 | 2017/12/15 |
| <input checked="" type="checkbox"/> | I.S.N.        | FCC-TLISN-T8-02 | FCC       | EC3756       | 2017/2/15  | 2018/2/14  |
| <input checked="" type="checkbox"/> | EMI chamber   | 3m              | Albatross | EC 3048      | 2016/9/10  | 2017/9/9   |
| <input checked="" type="checkbox"/> | Test Receiver | ESIB 26         | R&S       | EC 3045      | 2016/10/19 | 2017/10/18 |
| <input checked="" type="checkbox"/> | Bilog Antenna | CBL 6112D       | TESEQ     | EC 4206      | 2016/6/2   | 2017/6/1   |
| <input checked="" type="checkbox"/> | Horn antenna  | HF 906          | R&S       | EC 3049      | 2016/9/24  | 2017/9/23  |
| <input checked="" type="checkbox"/> | Pre-amplifier | Pre-amp 18      | R&S       | EC 5262      | 2016/6/30  | 2017/6/29  |
| <input checked="" type="checkbox"/> | H&F system    | PFS 503N        | EM TEST   | EC 5383      | 2017/3/17  | 2018/3/16  |
| <input checked="" type="checkbox"/> | H&F system    | DPA 503N        | EM TEST   | EC 5383-1    | 2017/3/27  | 2018/3/26  |
| <input checked="" type="checkbox"/> | H&F system    | NETWAVE30       | EM TEST   | EC 5383-2    | 2016/9/18  | 2017/9/17  |
| <input checked="" type="checkbox"/> | Shielded room | -               | Zhongyu   | EC 2838      | 2017/1/8   | 2018/1/7   |

### 2.2 Test Standard

47CFR Part 15 (2016)  
ANSI C63.10 (2013)  
RSS-210 Issue 9 (August 2016)  
RSS-Gen Issue 4 (November 2014)

### 2.3 Test Summary

**This report applies to tested sample only. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai Limited.**

| TEST ITEM                              | FCC REFERANCE   | RESULT |
|----------------------------------------|-----------------|--------|
| Radiated emission                      | 15.249 & 15.209 | Pass   |
| Assigned bandwidth<br>(20dB bandwidth) | 15.215(c)       | Pass   |
| Occupied bandwidth                     | -               | Pass   |
| Power line conducted<br>emission       | 15.207          | NA     |

Notes: NA =Not Applicable

### 3. Radiated emission

Test result: **PASS**

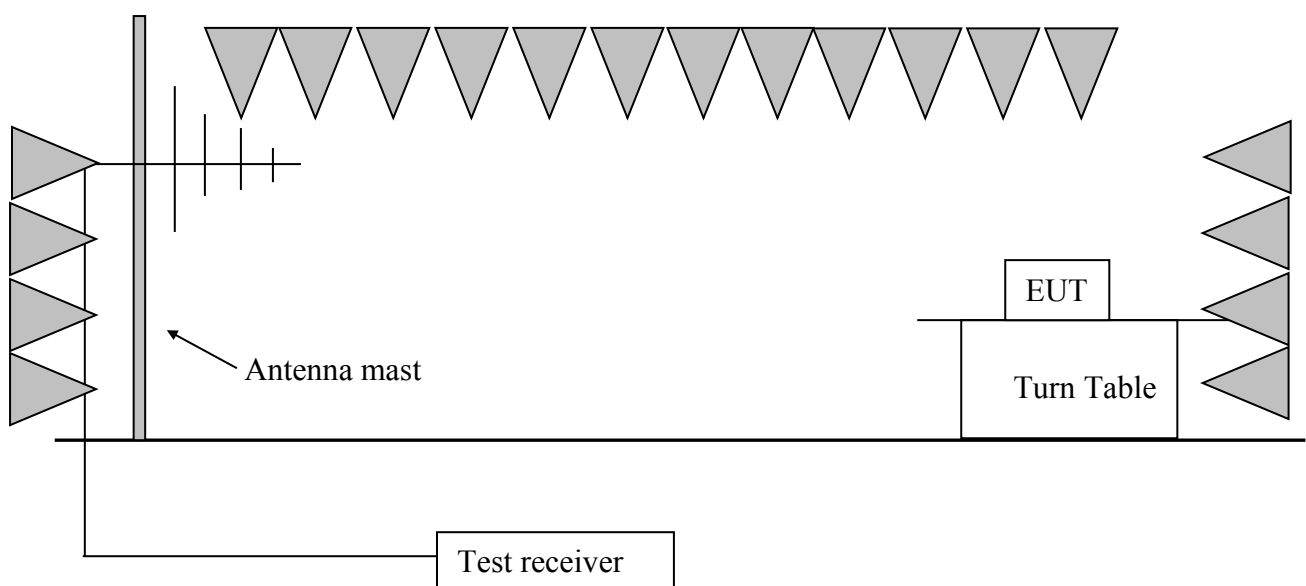
#### 3.1 Test limit

| Fundamental Frequency<br>(MHz)                | Fundamental limit<br>(dBuV/m) | Harmonic limit<br>(dBuV/m) |
|-----------------------------------------------|-------------------------------|----------------------------|
| <input checked="" type="checkbox"/> 902 - 928 | 94                            | 54                         |
| <input type="checkbox"/> 2400 - 2483.5        | 94                            | 54                         |
| <input type="checkbox"/> 5725 - 5875          | 94                            | 54                         |
| <input type="checkbox"/> 24000 - 24250        | 108                           | 68                         |

The radiated emissions which fall outside allocated band (2400-2483.5MHz), must also comply with the radiated emission limits specified in §15.209(a) showed as below:

| Frequency<br>(MHz) | Field Strength<br>(dBuV/m) | Measurement Distance<br>(m) |
|--------------------|----------------------------|-----------------------------|
| 30 - 88            | 40.0                       | 3                           |
| 88 - 216           | 43.5                       | 3                           |
| 216 - 960          | 46.0                       | 3                           |
| Above 960          | 54.0                       | 3                           |

#### 3.2 Test Configuration



### 3.3 Test procedure and test setup

The measurement was applied in a semi-anechoic chamber. While testing for spurious emission higher than 1GHz, if applied, the pre-amplifier would be equipped just at the output terminal of the antenna.

The EUT and simulators were placed on a 0.8m high wooden turntable above the horizontal metal ground plane. The turn table rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mast. The antenna moved up and down between from 1meter to 4 meters to find out the maximum emission level.

The radiated emission was measured using the Spectrum Analyzer with the resolutions bandwidth set as:

RBW=300 Hz, VBW=1 kHz (9 kHz~150 kHz);  
RBW=10kHz, VBW=30kHz (150kHz~30MHz);  
RBW = 100 kHz, VBW = 300 kHz (30MHz~1GHz for PK);  
RBW = 1MHz, VBW = 3MHz (>1GHz for PK).

### 3.4 Test protocol

Temperature : 25 °C  
Relative Humidity : 55 %

| CH      | Antenna  | Frequency (MHz) | Correct Factor (dB/m) | Corrected Reading (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector  |
|---------|----------|-----------------|-----------------------|----------------------------|----------------|-------------|-----------|
| 915 MHz | H        | 30.0            | 20.7                  | 24.7                       | 40.0           | 15.3        | PK        |
|         | H        | 43.6            | 13.0                  | 15.9                       | 40.0           | 24.1        | PK        |
|         | H        | 321.6           | 16.9                  | 21.5                       | 46.0           | 24.5        | PK        |
|         | H        | 494.6           | 20.8                  | 24.5                       | 46.0           | 21.5        | PK        |
|         | H        | 700.6           | 23.0                  | 28.7                       | 46.0           | 17.3        | PK        |
|         | <b>H</b> | <b>915.0</b>    | <b>25.6</b>           | <b>92.8</b>                | <b>94.0</b>    | <b>1.2</b>  | <b>PK</b> |
|         | H        | 2737.5          | -6.8                  | 46.3                       | 74.0           | 27.7        | PK        |
|         | H        | 4577.2          | -2.5                  | 51.4                       | 74.0           | 22.6        | PK        |
|         | H        | 6382.8          | 0.9                   | 49.1                       | 74.0           | 24.9        | PK        |
|         | H        | 8222.4          | 3.2                   | 47.9                       | 74.0           | 26.1        | PK        |
|         | H        | 12889.8         | 9.1                   | 45.2                       | 74.0           | 28.8        | PK        |
|         | H        | 15444.9         | 11.3                  | 47.3                       | 74.0           | 26.7        | PK        |
|         | V        | 30.0            | 20.7                  | 22.8                       | 40.0           | 17.2        | PK        |
|         | V        | 43.6            | 13.0                  | 15.4                       | 40.0           | 24.6        | PK        |
|         | V        | 76.7            | 8.4                   | 15.4                       | 40.0           | 24.6        | PK        |
|         | V        | 348.8           | 17.8                  | 21.1                       | 46.0           | 24.9        | PK        |
|         | V        | 463.5           | 20.3                  | 24.9                       | 46.0           | 21.1        | PK        |
|         | V        | 599.6           | 22.3                  | 28.4                       | 46.0           | 17.6        | PK        |
|         | <b>V</b> | <b>915.0</b>    | <b>25.6</b>           | <b>87.1</b>                | <b>94.0</b>    | <b>6.9</b>  | <b>PK</b> |
|         | V        | 2737.5          | -6.8                  | 44.2                       | 74.0           | 29.8        | PK        |
|         | V        | 5497.0          | -1.5                  | 46.6                       | 74.0           | 27.4        | PK        |
|         | V        | 6382.8          | 0.9                   | 46.9                       | 74.0           | 27.1        | PK        |
|         | V        | 8222.4          | 3.2                   | 48.7                       | 74.0           | 25.3        | PK        |
|         | V        | 12753.5         | 9.0                   | 46.0                       | 74.0           | 28.0        | PK        |
|         | V        | 16330.7         | 11.4                  | 47.2                       | 74.0           | 26.8        | PK        |

Remark:

1. For fundamental emission test, no pre-amplifier is employed;
2. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed);
3. Corrected Reading = Original Receiver Reading + Correct Factor;
4. Margin = limit – Corrected Reading;
5. If the PK reading is lower than AV limit, the AV test can be elided;
6. The shaded data is the fundamental emission;
7. Both emissions on “horizontal” and “vertical” axes were assessed and the worse test data was listed in this report;

Example:

Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,  
Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10dBuV,  
Then Correct Factor =  $30.20 + 2.00 - 32.00 = 0.20\text{dB/m}$ ,  
Corrected Reading =  $10\text{dBuV} + 0.20\text{dB/m} = 10.20\text{dBuV/m}$ ,  
Assuming limit = 54dBuV/m, Corrected Reading = 10.20dBuV/m,  
Then Margin =  $54 - 10.20 = 43.80\text{dBuV/m}$ .

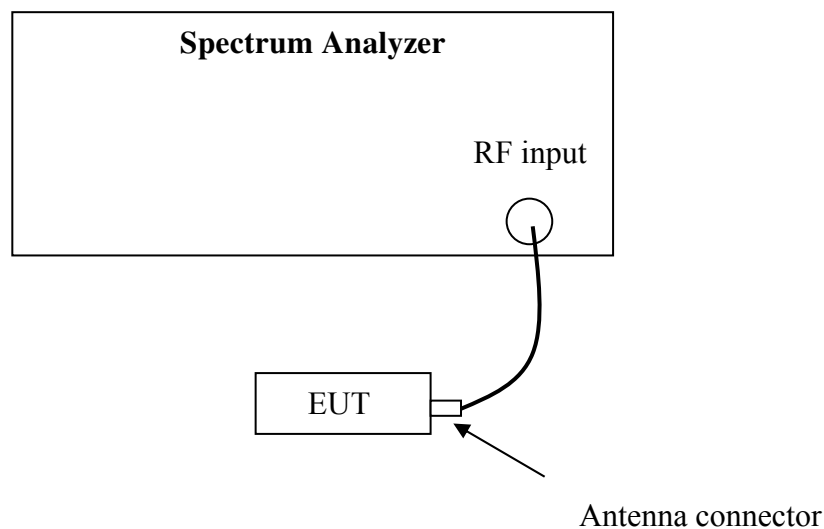
#### **4. Assigned bandwidth (20dB bandwidth)**

**Test result: PASS**

##### **4.1 Limit**

Intentional radiators must be designed to ensure that the 20 dB bandwidth of the emission is contained within the allocated frequency band as clause 3.1 shows.

##### **4.2 Test Configuration**



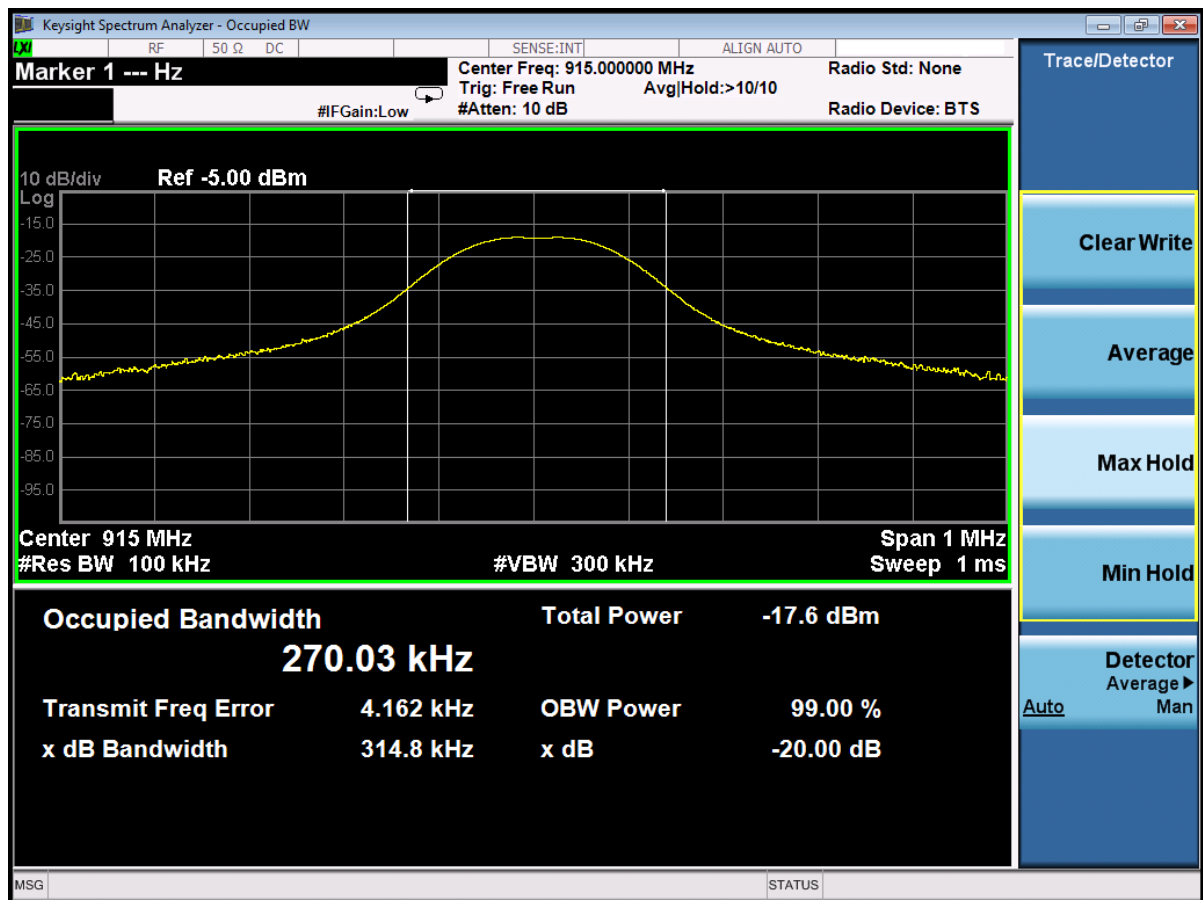
##### **4.3 Test procedure and test setup**

The 20dB Bandwidth per FCC § 15.215(c) is measured using the Spectrum Analyzer. Set Span = 2 to 3 times the 20 dB bandwidth,  $RBW \geq 1\%$  of the 20 dB bandwidth,  $VBW \geq RBW$ , Sweep = auto, Detector = peak, Trace = max hold. The test was performed at 3 channels (lowest, middle and highest channel).

#### 4.4 Test protocol

Temperature : 25°C  
Relative Humidity : 55 %

| Frequency | 20dB Bandwidth (kHz) | 99% Bandwidth (kHz) | F <sub>L</sub> (MHz) | F <sub>H</sub> (MHz) |
|-----------|----------------------|---------------------|----------------------|----------------------|
| 915MHz    | 314.8                | 270.03              | 914.849              | 915.164              |



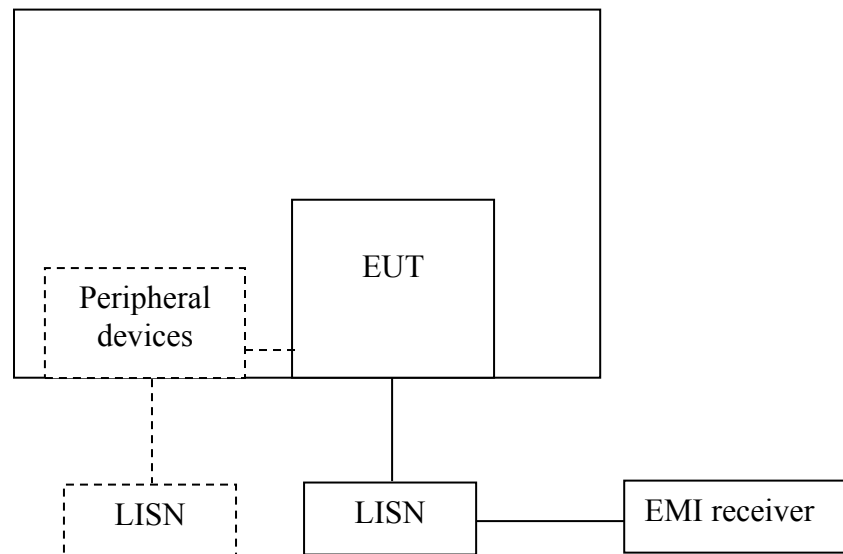
## 5. Power line conducted emission

Test result: NA

### 5.1 Limit

| Frequency of Emission (MHz)                      | Conducted Limit (dBuV) |            |
|--------------------------------------------------|------------------------|------------|
|                                                  | QP                     | AV         |
| 0.15-0.5                                         | 66 to 56*              | 56 to 46 * |
| 0.5-5                                            | 56                     | 46         |
| 5-30                                             | 60                     | 50         |
| * Decreases with the logarithm of the frequency. |                        |            |

### 5.2 Test configuration



- ☐ For table top equipment, wooden support is 0.8m height table
- ☐ For floor standing equipment, wooden support is 0.1m height rack.

### **5.3 Test procedure and test set up**

The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a  $50\Omega/50\mu\text{H}$  coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a  $50\Omega/50\mu\text{H}$  coupling impedance with  $50\Omega$  termination.

Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4 on conducted measurement. The bandwidth of the test receiver is set at 9 kHz.

### **5.4 Test protocol**

|                   |   |    |
|-------------------|---|----|
| Temperature       | : | °C |
| Relative Humidity | : | %  |