



## Shenzhen Huaxia Testing Technology Co., Ltd

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

Telephone: +86-755-26648640  
Fax: +86-755-26648637  
Website: [www.cqa-cert.com](http://www.cqa-cert.com)

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# RF Exposure Evaluation Report

**Report No. :** CQASZ20191101135E-04  
**Applicant:** XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD.  
**Address of Applicant:** (5/F) NO.168, QIANPU ROAD, SIMING DISTRICT, XIAMEN, CHINA  
**Equipment Under Test (EUT):**  
**Product:** Massage Chair  
**Model No.:** EC-7510A, BK-750  
**Test Model No.:** EC-7510A  
**Brand Name:** N/A  
**FCC ID:** YMX-EC7510A  
**Standards:** 47 CFR Part 1.1307  
47 CFR Part 2.1093  
KDB447498D01 General RF Exposure Guidance v06  
**Date of Receipt:** 2019-11-11  
**Date of Test:** 2019-11-11 to 2019-11-26  
**Date of Issue:** 2019-11-26  
**Test Result :** PASS\*

**Tested By:**

*Tom Chen*

(Tom chen)

**Reviewed By:**

*Aaron Ma*

(Aaron Ma)

**Approved By:**

*Jack Ai*  
(Jack Ai)



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

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

## 1 Version

### Revision History Of Report

| Report No.           | Version | Description    | Issue Date |
|----------------------|---------|----------------|------------|
| CQASZ20191101135E-04 | Rev.01  | Initial report | 2019-11-26 |

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### 3 General Information

#### 3.1 Client Information

|                          |                                                                                                           |
|--------------------------|-----------------------------------------------------------------------------------------------------------|
| Applicant:               | XIAMEN COMFORT SCIENCE & TECHNOLOGY GROUP CO., LTD.                                                       |
| Address of Applicant:    | (5/F) NO.168, QIANPU ROAD, SIMING DISTRICT, XIAMEN, CHINA                                                 |
| Manufacturer:            | XIAMEN HEALTHCARE ELECTRONIC CO.,LTD.                                                                     |
| Address of Manufacturer: | 65-66#, 62-63# BUILDING, SIMING ZONE, TONGAN INDUSTRIAL DISTRICT, XIAMEN CITY, FUJIAN PROVINCE, P.R.CHINA |

#### 3.2 General Description of EUT

|                   |                                                                                                                    |
|-------------------|--------------------------------------------------------------------------------------------------------------------|
| Product Name:     | Massage Chair                                                                                                      |
| Model No.:        | EC-7510A, BK-750                                                                                                   |
| Test Model No.:   | EC-7510A                                                                                                           |
| Trade Mark:       | N/A                                                                                                                |
| Hardware Version: | V1.0                                                                                                               |
| Software Version: | V1.0                                                                                                               |
| Sample Type:      | <input type="checkbox"/> Mobile <input type="checkbox"/> Portable <input checked="" type="checkbox"/> Fix Location |
| Power Supply:     | 120V60Hz                                                                                                           |

#### 3.3 General Description of BT

|                       |                                             |
|-----------------------|---------------------------------------------|
| Operation Frequency:  | 2402MHz~2480MHz                             |
| Modulation Technique: | Frequency Hopping Spread Spectrum(FHSS)     |
| Modulation Type:      | GFSK, $\pi/4$ DQPSK, 8DPSK                  |
| Number of Channel:    | 79                                          |
| Hopping Channel Type: | Adaptive Frequency Hopping systems          |
| Test Software of EUT: | RDA ToolKit 8.03.02 (manufacturer declare ) |
| Antenna Type:         | PCB antenna                                 |
| Antenna Gain:         | 2.0dBi                                      |

#### 3.4 General Description of BLE

|                       |                                       |
|-----------------------|---------------------------------------|
| Operation Frequency:  | 2402MHz~2480MHz                       |
| Modulation Type:      | GFSK                                  |
| Transfer Rate:        | 1Mbps                                 |
| Number of Channel:    | 40                                    |
| Test Software of EUT: | EMI_TEST_v1.1 (manufacturer declare ) |
| Antenna Type:         | PCB antenna                           |
| Antenna Gain:         | 3.0dBi                                |

#### 3.5 General Description of WIFI

|                      |                                                |
|----------------------|------------------------------------------------|
| Operation Frequency: | IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz     |
| Channel Numbers:     | IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels |
| Channel Separation:  | 5MHz                                           |

|                       |                                                                                                                                                                                                                            |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Type of Modulation:   | IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK)<br>IEEE for 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK)<br>IEEE for 802.11n(HT20) : OFDM (64QAM, 16QAM, QPSK, BPSK)                                                                   |
| Transfer Rate:        | IEEE for 802.11b:<br>1Mbps/2Mbps/5.5Mbps/11Mbps<br>IEEE for 802.11g :<br>6Mbps/9Mbps/12Mbps/18Mbps/24Mbps/36Mbps/48Mbps/54Mbps<br>IEEE for 802.11n(HT20) :<br>6.5Mbps/13Mbps/19.5Mbps/26Mbps/39Mbps/52Mbps/58.5Mbps/65Mbps |
| Test Software of EUT: | EspRFtestTool (manufacturer declare )                                                                                                                                                                                      |
| Antenna Type:         | PCB antenna                                                                                                                                                                                                                |
| Antenna Gain:         | 2.0dBi                                                                                                                                                                                                                     |

Note:

Model No.: EC-7510A, BK-750

Only the model EC-7510A was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, with difference being color of appearance and model name.

## 4 SAR Evaluation

### 4.1 RF Exposure Compliance Requirement

#### 4.1.1 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.

#### 4.1.2 Limits

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

$$\left[ \frac{\text{max. power of channel, including tune-up tolerance, mW}}{(\text{min. test separation distance, mm}) \cdot \sqrt{f(\text{GHz})}} \right] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR, where}$$

$f(\text{GHz})$  is the RF channel transmit frequency in GHz

Power and distance are rounded to the nearest mW and mm before calculation<sup>17</sup>

The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is  $\leq 50$  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

### 4.1.3 EUT RF Exposure

#### 1) For BT

#### Measurement Data

| GFSK mode        |                            |                            |                       |       |
|------------------|----------------------------|----------------------------|-----------------------|-------|
| Test channel     | Peak Output Power<br>(dBm) | Tune up tolerance<br>(dBm) | Maximum tune-up Power |       |
|                  |                            |                            | (dBm)                 | (mW)  |
| Lowest(2402MHz)  | -6.010                     | -7.0±1                     | -6.0                  | 0.251 |
| Middle(2441MHz)  | -5.950                     | -6.5±1                     | -5.5                  | 0.282 |
| Highest(2480MHz) | -4.950                     | -5.5±1                     | -4.5                  | 0.355 |
| π/4DQPSK mode    |                            |                            |                       |       |
| Test channel     | Peak Output Power<br>(dBm) | Tune up tolerance<br>(dBm) | Maximum tune-up Power |       |
|                  |                            |                            | (dBm)                 | (mW)  |
| Lowest(2402MHz)  | -6.350                     | -7.0±1                     | -6.0                  | 0.251 |
| Middle(2441MHz)  | -5.960                     | -6.5±1                     | -5.5                  | 0.282 |
| Highest(2480MHz) | -5.070                     | -6.0±1                     | -5.0                  | 0.316 |
| 8DPSK mode       |                            |                            |                       |       |
| Test channel     | Peak Output Power<br>(dBm) | Tune up tolerance<br>(dBm) | Maximum tune-up Power |       |
|                  |                            |                            | (dBm)                 | (mW)  |
| Lowest(2402MHz)  | -6.000                     | -6.5±1                     | -5.5                  | 0.282 |
| Middle(2441MHz)  | -5.600                     | -6.5±1                     | -5.5                  | 0.282 |
| Highest(2480MHz) | -4.610                     | -5.5±1                     | -4.5                  | 0.316 |

| Worst case: GFSK                                        |                                           |                         |                       |       |                  |                     |
|---------------------------------------------------------|-------------------------------------------|-------------------------|-----------------------|-------|------------------|---------------------|
| Channel                                                 | Maximum Peak Conducted Output Power (dBm) | Tune up tolerance (dBm) | Maximum tune-up Power |       | Calculated value | Exclusion threshold |
|                                                         |                                           |                         | (dBm)                 | (mW)  |                  |                     |
| Lowest (2402MHz)                                        | -6.000                                    | -6.5±1                  | -5.5                  | 0.282 | 0.087            | 3.0                 |
| Middle (2441MHz)                                        | -5.600                                    | -6.5±1                  | -5.5                  | 0.282 | 0.088            |                     |
| Highest (2480MHz)                                       | -4.610                                    | -5.5±1                  | -4.5                  | 0.316 | 0.100            |                     |
| Conclusion: the calculated value ≤3.0, SAR is exempted. |                                           |                         |                       |       |                  |                     |

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20191101135E-01

## 2) For BLE

### Measurement Data

| GFSK mode        |                            |                            |                       |       |
|------------------|----------------------------|----------------------------|-----------------------|-------|
| Test channel     | Peak Output Power<br>(dBm) | Tune up tolerance<br>(dBm) | Maximum tune-up Power |       |
|                  |                            |                            | (dBm)                 | (mW)  |
| Lowest(2402MHz)  | 1.26                       | 0.5±1                      | 1.5                   | 1.413 |
| Middle(2440MHz)  | 1.6                        | 1.0±1                      | 2.0                   | 1.585 |
| Highest(2480MHz) | 2.15                       | 1.5±1                      | 2.5                   | 1.778 |

| Worst case: GFSK                                        |                                           |                         |                       |       |                  |                     |
|---------------------------------------------------------|-------------------------------------------|-------------------------|-----------------------|-------|------------------|---------------------|
| Channel                                                 | Maximum Peak Conducted Output Power (dBm) | Tune up tolerance (dBm) | Maximum tune-up Power |       | Calculated value | Exclusion threshold |
|                                                         |                                           |                         | (dBm)                 | (mW)  |                  |                     |
| Lowest (2402MHz)                                        | 1.26                                      | 0.5±1                   | 1.5                   | 1.413 | 0.438            | 3.0                 |
| Middle (2440MHz)                                        | 1.6                                       | 1.0±1                   | 2.0                   | 1.585 | 0.495            |                     |
| Highest (2480MHz)                                       | 2.15                                      | 1.5±1                   | 2.5                   | 1.778 | 0.560            |                     |
| Conclusion: the calculated value ≤3.0, SAR is exempted. |                                           |                         |                       |       |                  |                     |

Remark: The Max Conducted Peak Output Power data refer to report Report No.: CQASZ20191101135E-02

### 3) For WIFI

#### Measurement Data

| IEEE for 802.11b mode       |                               |                            |                       |       |
|-----------------------------|-------------------------------|----------------------------|-----------------------|-------|
| Test channel                | Average Output Power<br>(dBm) | Tune up tolerance<br>(dBm) | Maximum tune-up Power |       |
|                             |                               |                            | (dBm)                 | (mW)  |
| Lowest(2412MHz)             | 7.66                          | 7.0±1                      | 8.0                   | 6.310 |
| Middle(2437MHz)             | 7.5                           | 7.0±1                      | 8.0                   | 6.310 |
| Highest(2462MHz)            | 7.85                          | 7.0±1                      | 8.0                   | 6.310 |
| IEEE for 802.11g mode       |                               |                            |                       |       |
| Test channel                | Average Output Power<br>(dBm) | Tune up tolerance<br>(dBm) | Maximum tune-up Power |       |
|                             |                               |                            | (dBm)                 | (mW)  |
| Lowest(2412MHz)             | 7.53                          | 7.0±1                      | 8.0                   | 6.310 |
| Middle(2437MHz)             | 7.39                          | 6.5±1                      | 7.5                   | 5.623 |
| Highest(2462MHz)            | 7.45                          | 6.5±1                      | 7.5                   | 5.623 |
| IEEE for 802.11n(HT20) mode |                               |                            |                       |       |
| Test channel                | Average Output Power<br>(dBm) | Tune up tolerance<br>(dBm) | Maximum tune-up Power |       |
|                             |                               |                            | (dBm)                 | (mW)  |
| Lowest(2412MHz)             | 7.37                          | 6.5±1                      | 7.5                   | 5.623 |
| Middle(2437MHz)             | 7.3                           | 6.5±1                      | 7.5                   | 5.623 |
| Highest(2462MHz)            | 7.2                           | 6.5±1                      | 7.5                   | 5.623 |

| Worst case: 802.11b mode                                |                                      |                         |                       |       |                  |                     |
|---------------------------------------------------------|--------------------------------------|-------------------------|-----------------------|-------|------------------|---------------------|
| Channel                                                 | Average Conducted Output Power (dBm) | Tune up tolerance (dBm) | Maximum tune-up Power |       | Calculated value | Exclusion threshold |
|                                                         |                                      |                         | (dBm)                 | (mW)  |                  |                     |
| Lowest (2412MHz)                                        | 7.66                                 | 7.0±1                   | 8.0                   | 6.310 | 1.960            | 3.0                 |
| Middle (2437MHz)                                        | 7.5                                  | 7.0±1                   | 8.0                   | 6.310 | 1.970            |                     |
| Highest (2462MHz)                                       | 7.85                                 | 7.0±1                   | 8.0                   | 6.310 | 1.980            |                     |
| Conclusion: the calculated value ≤3.0, SAR is exempted. |                                      |                         |                       |       |                  |                     |

Remark: The Max Conducted Average Output Power data refer to report Report No.: CQASZ20191101135E-03

WIFI, BDR, EDR and BLE can not simultaneous transmitting at same time.