

EN 55014-1:2017  
EN 55014-2:2015  
EN 61000-3-2:2019  
EN 61000-3-3:2013+A1:2019

## TEST REPORT

For

**SUZHOU ARMOCON TECHNOLOGY CO.,LTD**

3/F No 77 SuHong Middle Road SIP Jiangsu China

**Tested Model: Sila**

|                                        |                                                                                                                                                                                                                              |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Report Type:</b><br>Original Report | <b>Product Type:</b><br>Hand held massage                                                                                                                                                                                    |
| <b>Test Engineer:</b>                  | Gerry Xing                                                                                                                                                                                                                   |
| <b>Report Number:</b>                  | RSHD200701001-01A                                                                                                                                                                                                            |
| <b>Report Date:</b>                    | 2020-07-27                                                                                                                                                                                                                   |
| <b>Reviewed By:</b>                    | Oscar Ye<br>EMC Manager                                                                                                                                                                                                      |
| <b>Prepared By:</b>                    | Bay Area Compliance Laboratories Corp. (Kunshan)<br>No.248 Chenghu Road, Kunshan,Jiangsu province, China<br>Tel: +86-0512-86175000<br>Fax: +86-0512-88934268<br><a href="http://www.baclcorp.com.cn">www.baclcorp.com.cn</a> |

## **TABLE OF CONTENTS**

|                                                                                   |           |
|-----------------------------------------------------------------------------------|-----------|
| <b>GENERAL INFORMATION.....</b>                                                   | <b>4</b>  |
| PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) .....                          | 4         |
| OBJECTIVE .....                                                                   | 4         |
| RELATED SUBMITTAL(S)/GRANT(S).....                                                | 4         |
| TEST METHODOLOGY .....                                                            | 5         |
| TEST FACILITY .....                                                               | 5         |
| <b>SYSTEM TEST CONFIGURATION.....</b>                                             | <b>6</b>  |
| JUSTIFICATION .....                                                               | 6         |
| EUT EXERCISE SOFTWARE .....                                                       | 6         |
| EQUIPMENT MODIFICATIONS .....                                                     | 6         |
| SUPPORT EQUIPMENT LIST AND DETAILS .....                                          | 6         |
| EXTERNAL I/O CABLE.....                                                           | 6         |
| BLOCK DIAGRAM OF RADIATED TEST SETUP.....                                         | 7         |
| <b>SUMMARY OF TEST REPORT.....</b>                                                | <b>8</b>  |
| <b>EN 55014 §4.3.3.2-TERMINAL VOLTAGE.....</b>                                    | <b>9</b>  |
| MEASUREMENT UNCERTAINTY .....                                                     | 9         |
| EUT SETUP .....                                                                   | 9         |
| EMI TEST RECEIVER SETUP.....                                                      | 10        |
| TEST EQUIPMENT LIST AND DETAILS.....                                              | 10        |
| TEST PROCEDURE .....                                                              | 10        |
| FACTOR & OVER LIMIT CALCULATION.....                                              | 10        |
| TEST DATA .....                                                                   | 11        |
| <b>EN 55014 §4.3.4.5- RADIATED DISTURBANCE .....</b>                              | <b>13</b> |
| MEASUREMENT UNCERTAINTY .....                                                     | 13        |
| TEST SYSTEM SETUP .....                                                           | 13        |
| EMI TEST RECEIVER SETUP.....                                                      | 14        |
| TEST EQUIPMENT LIST AND DETAILS.....                                              | 14        |
| TEST PROCEDURE .....                                                              | 14        |
| FACTOR & OVER LIMIT CALCULATION.....                                              | 14        |
| TEST DATA .....                                                                   | 15        |
| <b>EN 55014-2 §5.1-ELECTROSTATIC DISCHARGE (IEC 61000-4-2).....</b>               | <b>17</b> |
| TEST EQUIPMENT .....                                                              | 17        |
| TEST SYSTEM SETUP .....                                                           | 17        |
| TEST STANDARD .....                                                               | 17        |
| TEST PROCEDURE .....                                                              | 18        |
| TEST DATA .....                                                                   | 18        |
| <b>EN 55014-2 §5.2-FAST TRANSIENTS (IEC 61000-4-4) .....</b>                      | <b>21</b> |
| TEST EQUIPMENT .....                                                              | 21        |
| TEST SYSTEM SETUP .....                                                           | 21        |
| TEST STANDARD .....                                                               | 21        |
| TEST PROCEDURE .....                                                              | 22        |
| TEST DATA .....                                                                   | 22        |
| <b>EN 55014-2 §5.4-INJECTED CURRENTS (0.15MHZ TO 230MHZ) (IEC 61000-4-6).....</b> | <b>23</b> |
| TEST EQUIPMENT .....                                                              | 23        |
| TEST SETUP.....                                                                   | 23        |
| TEST STANDARD .....                                                               | 23        |
| TEST PROCEDURE .....                                                              | 24        |
| TEST DATA .....                                                                   | 24        |

|                                                                                 |           |
|---------------------------------------------------------------------------------|-----------|
| <b>EN 55014-2 §5.5 - RADIO FREQUENCY ELECTROMAGNETIC FIELDS (IEC 61000-4-3)</b> | <b>25</b> |
| TEST EQUIPMENT                                                                  | 25        |
| TEST SYSTEM SETUP                                                               | 25        |
| TEST STANDARD                                                                   | 25        |
| TEST PROCEDURE                                                                  | 26        |
| TEST DATA                                                                       | 26        |
| <b>EN 55014-2 §5.6 SURGES (IEC 61000-4-5)</b>                                   | <b>27</b> |
| TEST EQUIPMENT                                                                  | 27        |
| TEST SYSTEM SETUP                                                               | 27        |
| TEST STANDARD                                                                   | 27        |
| TEST PROCEDURE                                                                  | 28        |
| TEST DATA                                                                       | 28        |
| <b>EN 55014-2 §5.7-VOLTAGE DIPS AND INTERRUPTIONS (IEC 61000-4-11)</b>          | <b>29</b> |
| TEST EQUIPMENT                                                                  | 29        |
| TEST SETUP                                                                      | 29        |
| TEST STANDARD                                                                   | 29        |
| TEST PROCEDURE                                                                  | 29        |
| TEST DATA                                                                       | 30        |
| <b>EN 61000-3-3 VOLTAGE FLUCTUATIONS AND FLICKER</b>                            | <b>31</b> |
| TEST EQUIPMENT                                                                  | 31        |
| TEST SYSTEM SETUP                                                               | 31        |
| TEST STANDARD                                                                   | 31        |
| TEST DATA                                                                       | 32        |
| <b>EXHIBIT A - EUT PHOTOGRAPHS</b>                                              | <b>34</b> |
| <b>EXHIBIT B - TEST SETUP PHOTOGRAPHS</b>                                       | <b>47</b> |
| TERMINAL VOLTAGE - FRONT SIDE                                                   | 47        |
| TERMINAL VOLTAGE - REAR SIDE                                                    | 47        |
| RADIATED DISTURBANCE - FRONT VIEW (BELOW 1GHz)                                  | 48        |
| RADIATED DISTURBANCE - REAR VIEW (BELOW 1GHz)                                   | 48        |
| FLICKER TEST SETUP PHOTO                                                        | 49        |
| ESD TEST SETUP PHOTO                                                            | 49        |
| EFT TEST SETUP PHOTO                                                            | 50        |
| CS TEST SETUP PHOTO                                                             | 50        |
| RS TEST SETUP PHOTO(BELOW 1GHz)                                                 | 51        |
| SURGES TEST SETUP PHOTO                                                         | 51        |
| DIPS TEST SETUP PHOTO                                                           | 52        |

## GENERAL INFORMATION

### Product Description for Equipment under Test (EUT)

|              |                                          |
|--------------|------------------------------------------|
| Applicant    | SUZHOU ARMOCON TECHNOLOGY CO.,LTD        |
| Test Model   | Sila                                     |
| Product      | Hand held massage                        |
| Rate Voltage | DC 5V from adapter, battery voltage 3.7V |

*\*All measurement and test data in this report was gathered from production sample serial number: 20200701001.  
(Assigned by the BACL. The EUT supplied by the applicant was received on 2020-07-01)*

### Objective

The following report is prepared on behalf of *SUZHOU ARMOCON TECHNOLOGY CO.,LTD* in accordance with EN 55014-1, Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus Part 1: Emission.

EN 55014-2, Electromagnetic compatibility – Requirements for household appliances, electric tools and similar apparatus Part 2: Immunity- Product family standard.

EN61000-3-2, Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current  $\leq 16$  A per phase).

EN 61000-3-3, Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current  $\leq 16$  A per phase and not subject to conditional connection.

The objective of the manufacturer is to determine the compliance of the EUT with EN 55014-1, EN 55014-2, EN 61000-3-2 and EN 61000-3-3.

### Related Submittal(s)/Grant(s)

No related submittal(s).

## Test Methodology

All measurements contained in this report were conducted with CISPR 16-1-1:2015: Specification for radio disturbance and immunity measuring apparatus and methods Part1-1: Radio disturbance and immunity measuring apparatus-Measuring apparatus.

CISPR 16-1-2:2014, Specification for radio disturbance and immunity measuring apparatus and methods - Part 1-2: Radio disturbance and immunity measuring apparatus - Coupling devices for conducted disturbance measurements.

CISPR 16-1-4-2010+A1-2012, Specification for radio disturbance and immunity measuring apparatus and methods-Part 1-4: Radio disturbance and immunity measuring apparatus - Antennas and test sites for radiated disturbance measurements.

CISPR 16-2-1:2014, Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-1: Methods of measurement of disturbances and immunity -Conducted disturbance measurements.

CISPR 16-2-3: 2016, Specification for radio disturbance and immunity measuring apparatus and methods - Part 2-3: Methods of measurement of disturbances and immunity -Radiated disturbance measurements.

CISPR 16-4-2: 2011+A1-2014, Specification for radio disturbance and immunity measuring apparatus and methods –Part 4-2: Uncertainties, statistics and limit modeling -Measurement instrumentation uncertainty.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 Meters.

## Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road, Kunshan,Jiangsu province, China.

Bay Area Compliance Laboratories Corp. (Kunshan) Lab is accredited to ISO/IEC 17025 by A2LA (Lab code: 4323.01) and the FCC designation No. CN1185 under the FCC KDB 974614 D01 and CAB identifier CN0004 under the ISED requirement. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2014.

## SYSTEM TEST CONFIGURATION

### Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

*Test mode: Normal working*

### EUT Exercise Software

No exercise software was used to test.

### Equipment Modifications

No modification was made to the EUT.

### Support Equipment List and Details

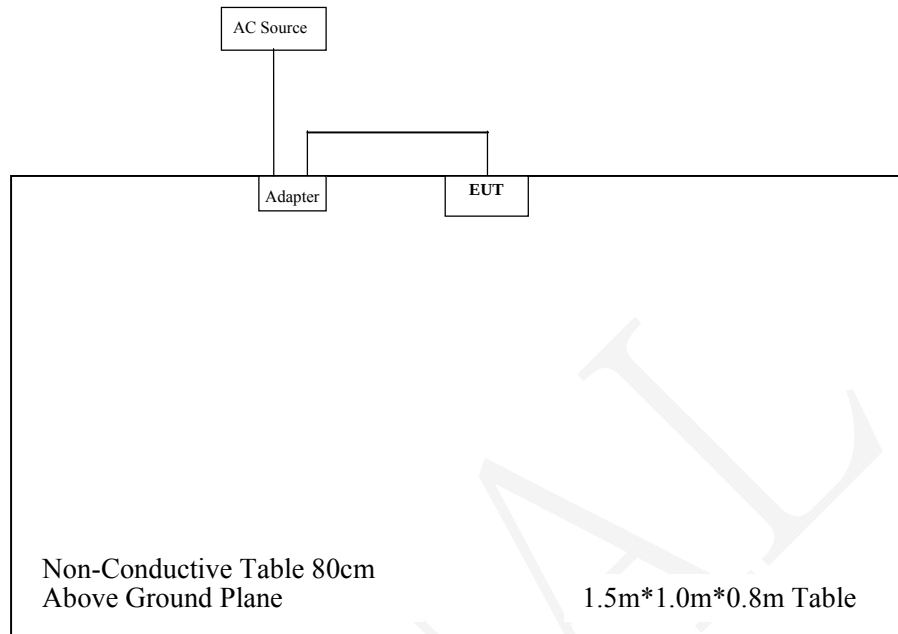
| Manufacturer                           | Description | Model            | Serial Number |
|----------------------------------------|-------------|------------------|---------------|
| SHENZHENTIANYIN<br>ELECTRONICS CO.,LTD | Adapter     | TPA-46B050100UVU | /             |

### External I/O Cable

| Cable Description | Length (m) | From/Port | To      |
|-------------------|------------|-----------|---------|
| Power Cable       | 1.0        | EUT       | Adapter |

## Block Diagram of Radiated Test Setup

*Test mode: Normal working*



**SUMMARY OF TEST REPORT****EN 55014-1**

| Rule      | Description          | Results   |
|-----------|----------------------|-----------|
| § 4.3.3.2 | Terminal Voltage     | Compliant |
| §4.3.4.5  | Radiated Disturbance | Compliant |

**EN 55014-2**

| Rule  | Description                                            | Results                     |
|-------|--------------------------------------------------------|-----------------------------|
| § 5.1 | Electrostatic Discharge (IEC 61000-4-2)                | Compliant                   |
| § 5.2 | Fast Transients (IEC 61000-4-4)                        | Compliant                   |
| § 5.3 | Injected Currents (0.15MHz to 230MHz) (IEC 61000-4-6)  | Not Applicable <sup>1</sup> |
| § 5.4 | Injected Currents(0.15MHz to 80MHz) (IEC 61000-4-6)    | Compliant                   |
| § 5.5 | Radio Frequency Electromagnetic Fields (IEC 61000-4-3) | Compliant                   |
| § 5.6 | Surges (IEC 61000-4-5)                                 | Compliant                   |
| § 5.7 | Voltage Dips and Interruptions (IEC 61000-4-11)        | Compliant                   |

**EN 61000-3-2**

| Rule   | Description                | Results                     |
|--------|----------------------------|-----------------------------|
| §6、 §7 | Harmonic Current Emissions | Not Applicable <sup>2</sup> |

**EN 61000-3-3**

| Rule   | Description                     | Results   |
|--------|---------------------------------|-----------|
| §5、 §6 | Voltage Fluctuation and Flicker | Compliant |

Note:

Not Applicable<sup>1</sup>: EUT is Category IV apparatus.

Not Applicable<sup>2</sup>: Equipment with a rated power of 75W or less, other than lighting equipment, is not included in this standard.

## EN 55014 §4.3.3.2-TERMINAL VOLTAGE

### Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If  $U_{lab}$  is less than or equal to  $U_{cispr}$  of Table 1, then:

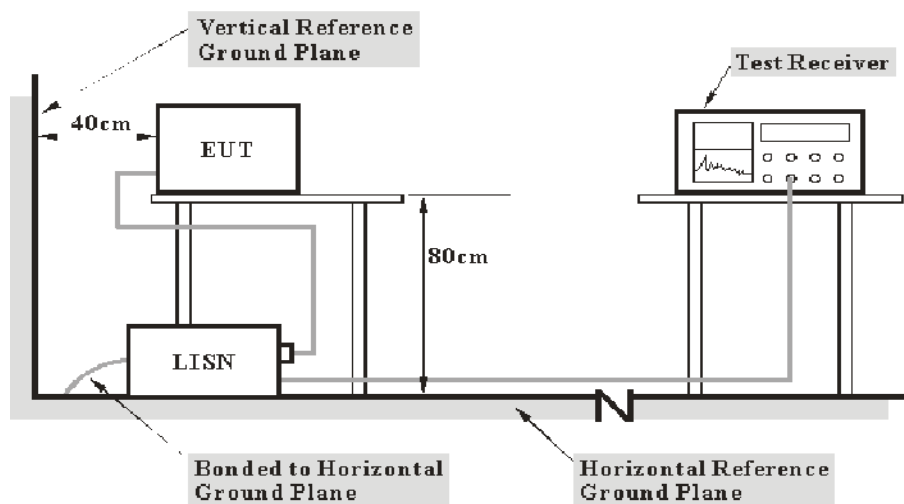
- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

If  $U_{lab}$  is greater than  $U_{cispr}$  of Table 1, then:

- compliance is deemed to occur if no measured disturbance level, increased by  $(U_{lab} - U_{cispr})$ , exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by  $(U_{lab} - U_{cispr})$ , exceeds the disturbance limit.

| Item |              | Measurement Uncertainty | $U_{cispr}$ |
|------|--------------|-------------------------|-------------|
| AMN  | 150kHz~30MHz | 3.19 dB                 | 3.4 dB      |

### EUT Setup



- Note: 1. Support units were connected to second LISN.  
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per CISPR 16-2-1:2014 measurement procedures. The specification used was with the EN 55014-1:2017 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

### EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz

During the conducted emission test, the EMI test receiver was set with the following configurations:

| Frequency Range  | IF B/W |
|------------------|--------|
| 150 kHz – 30 MHz | 9 kHz  |

### Test Equipment List and Details

| Manufacturer    | Description       | Model   | Serial Number              | Calibration Date | Calibration Due Date |
|-----------------|-------------------|---------|----------------------------|------------------|----------------------|
| Rohde & Schwarz | EMI Test Receiver | ESR     | 1316.3003K03<br>-101746-zn | 2019-08-05       | 2020-08-04           |
| ROHDE&SCHWARZ   | LISN              | ENV216  | 3560655016                 | 2019-11-30       | 2020-11-29           |
| Rohde & Schwarz | Pluse limiter     | ESH3-Z2 | 100552                     | 2019-08-10       | 2020-08-09           |
| Audix           | Test Software     | e3      | V9                         | --               | --                   |
| MICRO-COAX      | Coaxial Cable     | Cable-6 | 006                        | 2019-09-08       | 2020-09-07           |

**\* Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

### Test Procedure

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

### Factor & Over Limit Calculation

The Factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

$$\text{Factor (dB)} = \text{LISN VDF (dB)} + \text{Cable Loss (dB)} + \text{Attenuation (dB)}$$

The “**Over Limit**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over Limit of 7dB means the emission is 7 dB above the limit. The equation for over limit calculation is as follows:

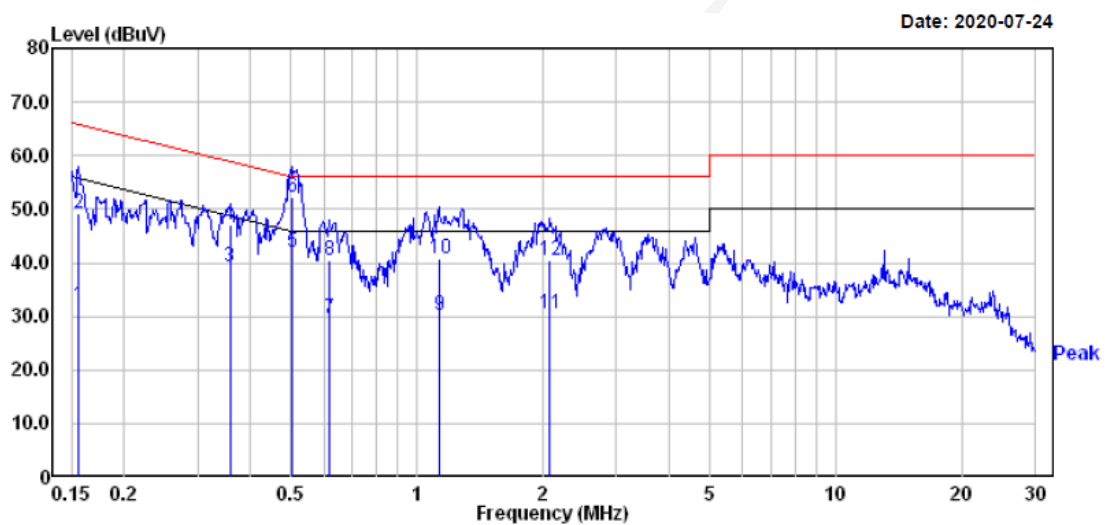
$$\text{Over Limit (dB)} = \text{Read level (dB}\mu\text{V)} + \text{Factor (dB)} - \text{Limit (dB}\mu\text{V)}$$

**Test Data****Environmental Conditions**

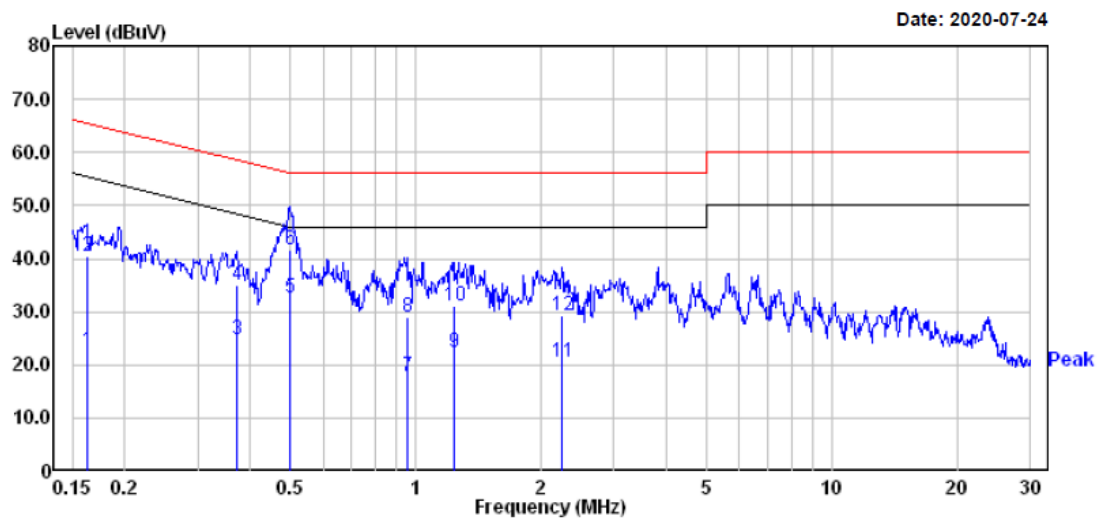
|                           |          |
|---------------------------|----------|
| <b>Temperature:</b>       | 24.3℃    |
| <b>Relative Humidity:</b> | 53%      |
| <b>ATM Pressure:</b>      | 101.3kPa |

The testing was performed by Gerry Xing on 2020-07-24.

Test mode: Normal working

**Line:**

|    |       | Read  |        |       | Limit | Over   |         |
|----|-------|-------|--------|-------|-------|--------|---------|
|    | Freq  | Level | Factor | Level | Line  | Limit  | Remark  |
|    | MHz   | dBuV  | dB     | dBuV  | dBuV  | dB     |         |
| 1  | 0.156 | 12.10 | 19.82  | 31.92 | 55.69 | -23.77 | Average |
| 2  | 0.156 | 29.30 | 19.82  | 49.12 | 65.69 | -16.57 | QP      |
| 3  | 0.358 | 19.40 | 19.80  | 39.20 | 48.78 | -9.58  | Average |
| 4  | 0.358 | 27.40 | 19.80  | 47.20 | 58.78 | -11.58 | QP      |
| 5  | 0.502 | 22.30 | 19.76  | 42.06 | 46.00 | -3.94  | Average |
| 6  | 0.502 | 32.60 | 19.76  | 52.36 | 56.00 | -3.64  | QP      |
| 7  | 0.617 | 9.80  | 19.75  | 29.55 | 46.00 | -16.45 | Average |
| 8  | 0.617 | 20.65 | 19.75  | 40.40 | 56.00 | -15.60 | QP      |
| 9  | 1.129 | 10.30 | 19.81  | 30.11 | 46.00 | -15.89 | Average |
| 10 | 1.129 | 21.00 | 19.81  | 40.81 | 56.00 | -15.19 | QP      |
| 11 | 2.077 | 10.60 | 19.77  | 30.37 | 46.00 | -15.63 | Average |
| 12 | 2.077 | 20.70 | 19.77  | 40.47 | 56.00 | -15.53 | QP      |

**Neutral:**

|    | Freq  | Read Level | Factor | Level | Limit Line | Over Limit | Remark  |
|----|-------|------------|--------|-------|------------|------------|---------|
|    | MHz   | dBuV       | dB     | dBuV  | dBuV       | dB         |         |
| 1  | 0.162 | 2.70       | 19.83  | 22.53 | 55.34      | -32.81     | Average |
| 2  | 0.162 | 20.60      | 19.83  | 40.43 | 65.34      | -24.91     | QP      |
| 3  | 0.371 | 5.00       | 19.78  | 24.78 | 48.47      | -23.69     | Average |
| 4  | 0.371 | 15.10      | 19.78  | 34.88 | 58.47      | -23.59     | QP      |
| 5  | 0.499 | 12.70      | 19.76  | 32.46 | 46.01      | -13.55     | Average |
| 6  | 0.499 | 22.00      | 19.76  | 41.76 | 56.01      | -14.25     | QP      |
| 7  | 0.953 | -2.10      | 19.78  | 17.68 | 46.00      | -28.32     | Average |
| 8  | 0.953 | 9.20       | 19.78  | 28.98 | 56.00      | -27.02     | QP      |
| 9  | 1.236 | 2.61       | 19.81  | 22.42 | 46.00      | -23.58     | Average |
| 10 | 1.236 | 11.41      | 19.81  | 31.22 | 56.00      | -24.78     | QP      |
| 11 | 2.249 | 0.90       | 19.64  | 20.54 | 46.00      | -25.46     | Average |
| 12 | 2.249 | 9.60       | 19.64  | 29.24 | 56.00      | -26.76     | QP      |

**Note:**

- 1) Factor (dB) = LISN VDF (dB) + Cable Loss (dB) + Transient Limiter Attenuation (dB)
- 2) Over Limit (dB) = Read level (dBuV) + Factor (dB) - Limit (dBuV)

## EN 55014 §4.3.4.5- Radiated Disturbance

### Measurement Uncertainty

Compliance or non-compliance with a disturbance limit shall be determined in the following manner:

If  $U_{lab}$  is less than or equal to  $U_{cispr}$  of Table 1, then:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

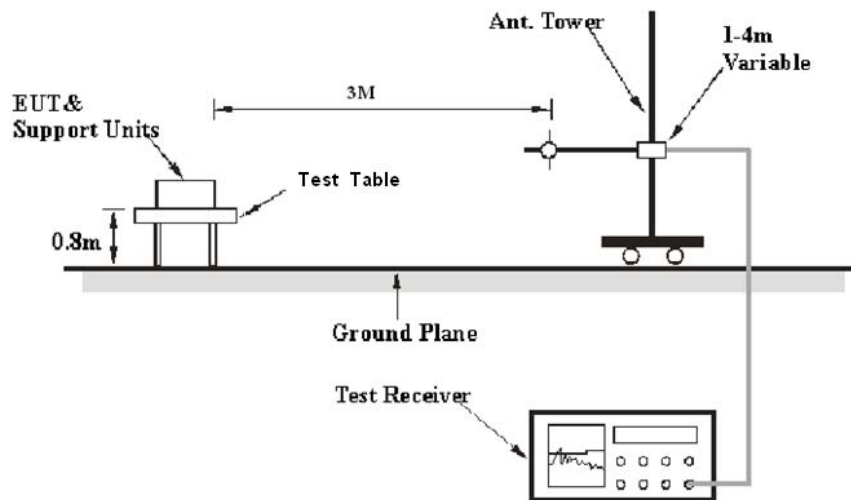
If  $U_{lab}$  is greater than  $U_{cispr}$  of Table 1, then:

- compliance is deemed to occur if no measured disturbance level, increased by  $(U_{lab} - U_{cispr})$ , exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level, increased by  $(U_{lab} - U_{cispr})$ , exceeds the disturbance limit.

| Item              |            | Measurement Uncertainty | $U_{cispr}$ |
|-------------------|------------|-------------------------|-------------|
| Radiated Emission | 30MHz~1GHz | 5.91dB                  | 6.3 dB      |

### Test System Setup

Below 1GHz:



The radiated emission tests were performed in the 3 meters, using the setup accordance with the CISPR 16-2-3: 2016. The specification used was the EN 55014-1:2017.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

## EMI Test Receiver Setup

The system was investigated from 30 MHz to 1 GHz.

During the radiated emission test, the EMI test receiver Setup was set with the following configurations:

| Frequency Range  | RBW     | Video B/W | IF B/W | Detector |
|------------------|---------|-----------|--------|----------|
| 30MHz – 1000 MHz | 120 kHz | 300 kHz   | 120kHz | QP       |

## Test Equipment List and Details

| Manufacturer      | Description       | Model      | Serial Number | Calibration Date | Calibration Due Date |
|-------------------|-------------------|------------|---------------|------------------|----------------------|
| Sonoma Instrument | Amplifier         | 310N       | 185700        | 2019-08-14       | 2020-08-13           |
| Rohde & Schwarz   | EMI Test Receiver | ESR        | 102454        | 2019-12-14       | 2020-12-13           |
| Sunol Sciences    | Bilog antenna     | JB3        | A060217       | 2017-08-04       | 2020-08-03           |
| Albatross         | Chamber 3#        | 3m-SAC 966 | NA            | 2019-05-08       | 2022-05-07           |
| Audix             | Test Software     | e3         | V9            | /                | /                    |
| MICRO-COAX        | Coaxial Cable     | Cable-8    | 008           | 2019-08-15       | 2020-08-14           |
| MICRO-COAX        | Coaxial Cable     | Cable-9    | 009           | 2019-08-15       | 2020-08-14           |
| MICRO-COAX        | Coaxial Cable     | Cable-10   | 010           | 2019-08-15       | 2020-08-14           |

**\* Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

## Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detection mode from 30MHz to 1GHz.

## Factor & Over Limit Calculation

The Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

Factor = Antenna Factor + Cable Loss - Amplifier Gain

The “**Over Limit**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over Limit of 7 dB means the emission is 7 dB above the limit. The equation for Over Limit calculation is as follows:

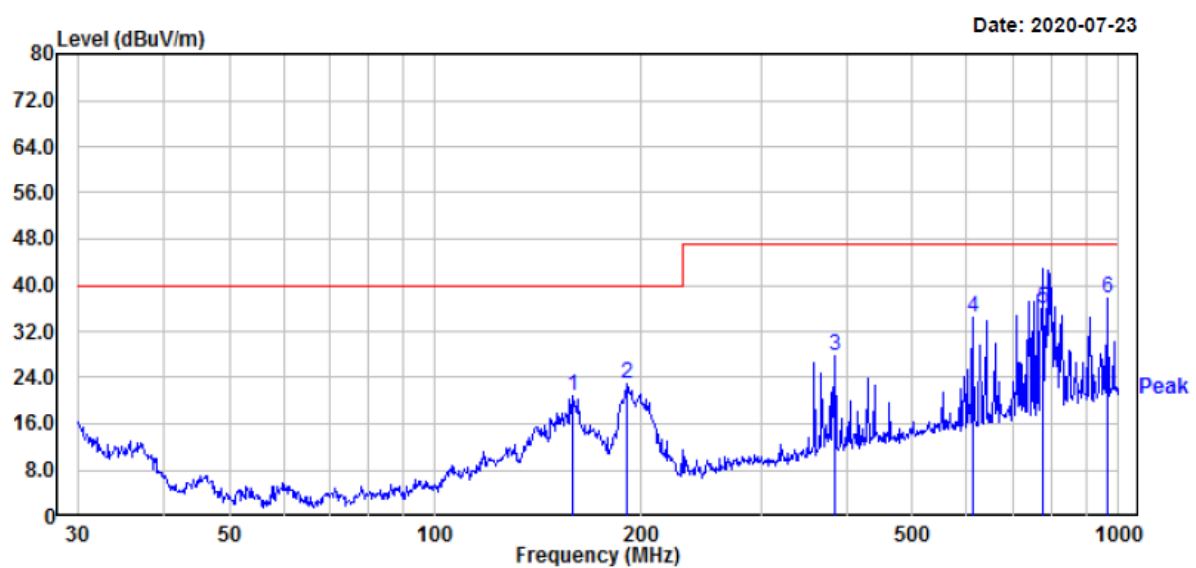
Over Limit (dB) = Read level (dBμV) + Factor (dB) - Limit (dBμV)

**Test Data****Environmental Conditions**

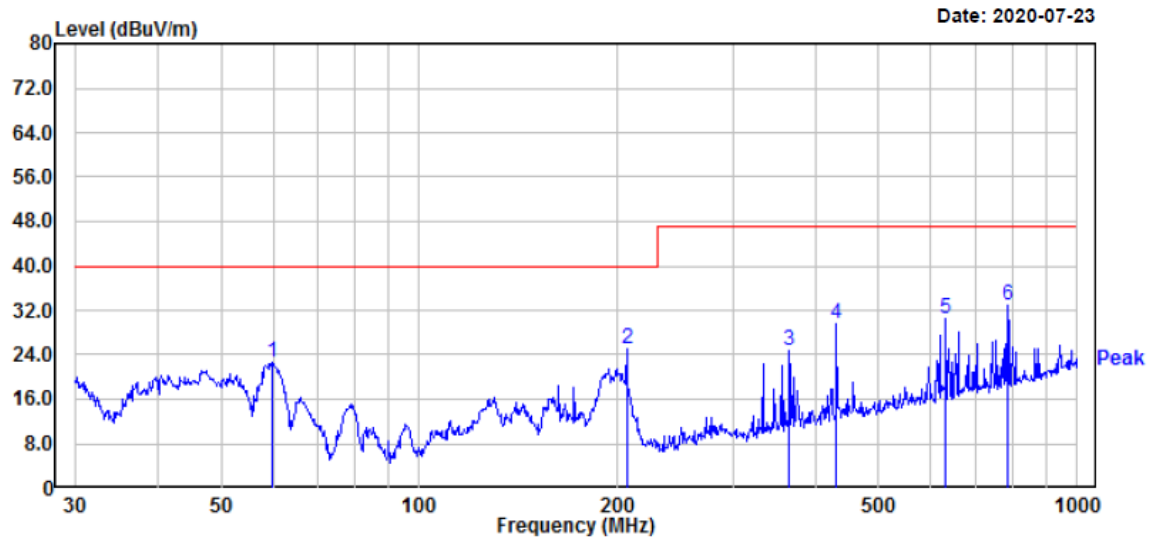
|                           |          |
|---------------------------|----------|
| <b>Temperature:</b>       | 25.1℃    |
| <b>Relative Humidity:</b> | 53%      |
| <b>ATM Pressure:</b>      | 101.2kPa |

The testing was performed by Gerry Xing on 2020-07-23.

Test mode: Normal working

**Horizontal:**

|   | Freq   | Read Level | Factor | Level  | Limit Line | Over Limit | APos | TPos | Remark |
|---|--------|------------|--------|--------|------------|------------|------|------|--------|
|   | MHz    | dBuV       | dB/m   | dBuV/m | dBuV/m     | dB         | cm   | deg  |        |
| 1 | 158.67 | 38.84      | -18.01 | 20.83  | 40.00      | -19.17     | 200  | 1    | Peak   |
| 2 | 191.07 | 41.15      | -18.22 | 22.93  | 40.00      | -17.07     | 200  | 360  | Peak   |
| 3 | 385.28 | 41.85      | -14.02 | 27.83  | 47.00      | -19.17     | 200  | 186  | Peak   |
| 4 | 612.06 | 44.29      | -9.77  | 34.52  | 47.00      | -12.48     | 200  | 55   | Peak   |
| 5 | 776.88 | 43.00      | -7.05  | 35.95  | 47.00      | -11.05     | 100  | 13   | QP     |
| 6 | 962.16 | 41.52      | -3.71  | 37.81  | 47.00      | -9.19      | 100  | 207  | Peak   |

**Vertical:**

|   | Freq   | Read Level | Factor | Level  | Limit Line | Over Limit | APos | TPos | Remark |
|---|--------|------------|--------|--------|------------|------------|------|------|--------|
|   | MHz    | dBuV       | dB/m   | dBuV/m | dBuV/m     | dB         | cm   | deg  |        |
| 1 | 59.65  | 46.15      | -23.54 | 22.61  | 40.00      | -17.39     | 100  | 362  | Peak   |
| 2 | 207.12 | 43.19      | -18.28 | 24.91  | 40.00      | -15.09     | 100  | 362  | Peak   |
| 3 | 365.54 | 39.39      | -14.68 | 24.71  | 47.00      | -22.29     | 115  | 362  | Peak   |
| 4 | 431.03 | 42.58      | -13.00 | 29.58  | 47.00      | -17.42     | 100  | 229  | Peak   |
| 5 | 631.69 | 39.89      | -9.40  | 30.49  | 47.00      | -16.51     | 100  | 199  | Peak   |
| 6 | 785.09 | 39.85      | -6.95  | 32.90  | 47.00      | -14.10     | 100  | 193  | Peak   |

## Note:

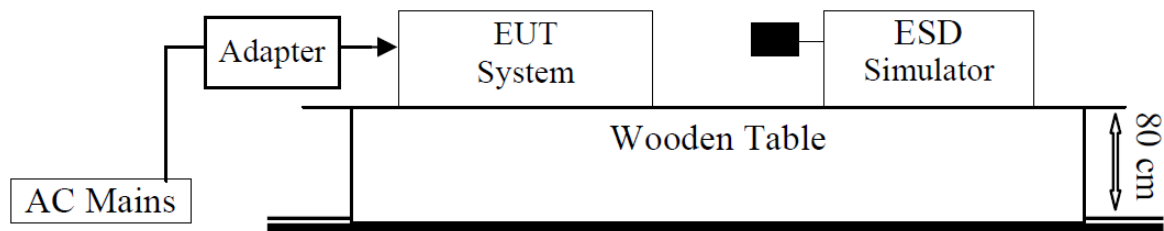
Factor = Antenna Factor + Cable Loss - Amplifier Gain

Over Limit (dB) = Read level (dBuV) + Factor (dB) - Limit (dBuV)

**EN 55014-2 §5.1-ELECTROSTATIC DISCHARGE (IEC 61000-4-2)****Test Equipment**

| Manufacturer | Description   | Model   | Serial Number | Calibration Date | Calibration Due Date |
|--------------|---------------|---------|---------------|------------------|----------------------|
| TESEQ        | ESD Simulator | NSG 438 | 1079          | 2020-05-17       | 2021-05-16           |

**\* Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

**Test System Setup**

Remark: ■ is the tip of the electrode

IEC 61000-4-2 specifies that a tabletop EUT shall be placed on a non-conducting table which is 80 centimeters above a ground reference plane and that floor mounted equipment shall be placed on an insulating support approximately 10 centimeters above a ground plane. During the tests, the EUT is positioned over a ground reference plane in conformance with this requirement.

For tabletop equipment, a 1.6 by 0.8-meter metal sheet (HCP) is placed on the table and connected to the ground plane via a metal strap with two 470 k Ohms resistors in series. The EUT and attached cables are isolated from this metal sheet by 0.5-millimeter thick insulating material. A Vertical Coupling Plane (VCP) grounded on the ground plane through the same configuration as in the HCP is used.

**Test Standard**

EN 55014-2:2015 / IEC 61000-4-2:2008

Air Discharge at  $\pm 2$  kV,  $\pm 4$  kV,  $\pm 8$  kV

Contact Discharge at  $\pm 2$  kV,  $\pm 4$  kV

**Test Level**

| Level | Test Voltage<br>Contact Discharge ( $\pm$ kV) | Test Voltage<br>Air Discharge ( $\pm$ kV) |
|-------|-----------------------------------------------|-------------------------------------------|
| 1.    | 2                                             | 2                                         |
| 2.    | 4                                             | 4                                         |
| 3.    | 6                                             | 8                                         |
| 4.    | 8                                             | 15                                        |
| X.    | Special                                       | Special                                   |

**Performance Criterion: B**

## Test Procedure

### Air Discharge:

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

### Contact Discharge:

All the procedure shall be same as Section 8.3.1.of IEC 61000-4-2, except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

### Indirect discharge for horizontal coupling plane

At least 20 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The discharge electrode positions vertically at a distance of 0.1m from the EUT and with the discharge electrode touching the coupling plane.

### Indirect discharge for vertical coupling plane

At least 20 single discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m \* 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

## Test Data

### Environmental Conditions

|                    |          |
|--------------------|----------|
| Temperature:       | 24.5 °C  |
| Relative Humidity: | 55 %     |
| ATM Pressure:      | 101.2kPa |

*The testing was performed by Gerry Xing on 2020-07-26.*

*Test mode: Normal working*

**Table 1: Electrostatic Discharge Immunity (Air Discharge)**

| EN 61000-4-2 Test Points<br>Location | Test Levels |       |       |       |       |       |        |        |   |
|--------------------------------------|-------------|-------|-------|-------|-------|-------|--------|--------|---|
|                                      | -2 kV       | +2 kV | -4 kV | +4 kV | -8 kV | +8 kV | -15 kV | +15 kV | X |
| 1~5                                  | A           | A     | A     | A     | A     | A     | /      | /      | / |

**Table 2: Electrostatic Discharge Immunity (Contact Discharge)**

| EN 61000-4-2 Test Points<br>Location | Test Levels |       |       |       |       |       |       |       |   |
|--------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|---|
|                                      | -2 kV       | +2 kV | -4 kV | +4 kV | -6 kV | +6 kV | -8 kV | +8 kV | X |
| 6                                    | A           | A     | A     | A     | /     | /     | /     | /     | / |

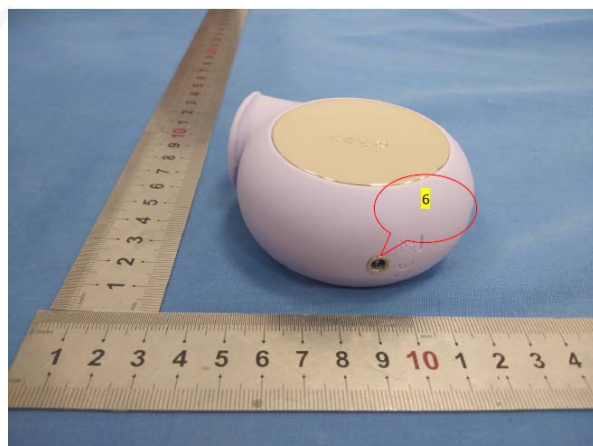
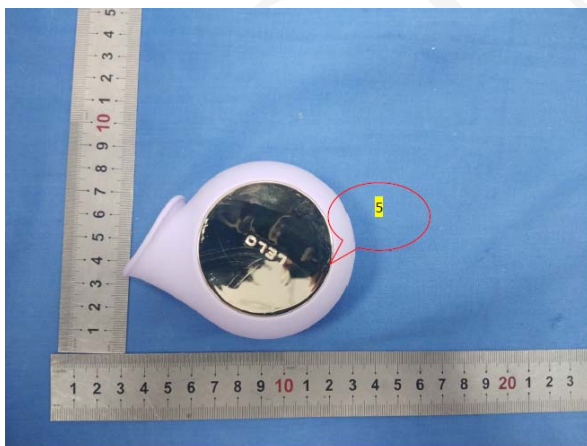
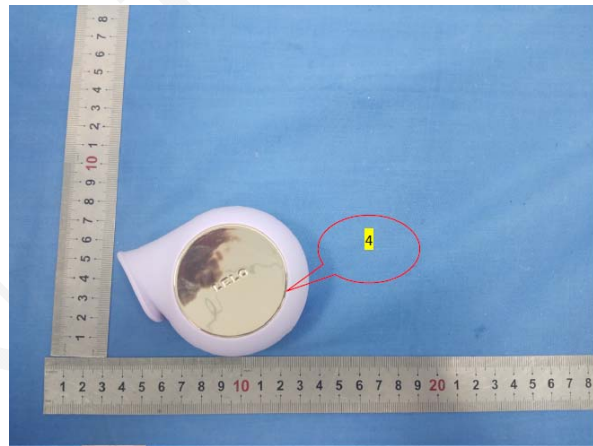
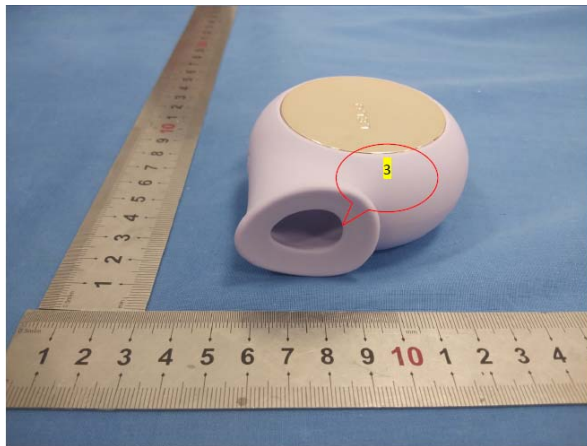
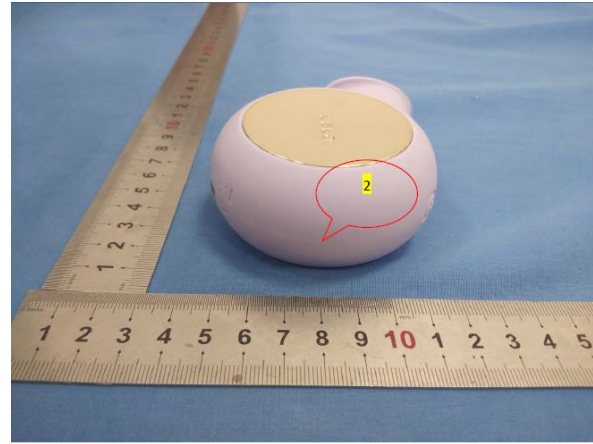
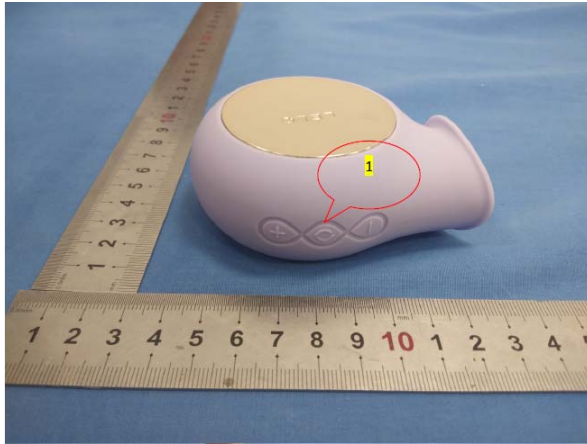
**Table 3: Electrostatic Discharge Immunity (Indirect Contact HCP)**

| EN 61000-4-2 Test Points<br>Location | Test Levels |       |       |       |       |       |       |       |   |
|--------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|---|
|                                      | -2 kV       | +2 kV | -4 kV | +4 kV | -6 kV | +6 kV | -8 kV | +8 kV | X |
| Front Side                           | A           | A     | A     | A     | /     | /     | /     | /     | / |
| Back Side                            | A           | A     | A     | A     | /     | /     | /     | /     | / |
| Left Side                            | A           | A     | A     | A     | /     | /     | /     | /     | / |
| Right Side                           | A           | A     | A     | A     | /     | /     | /     | /     | / |

**Table 4: Electrostatic Discharge Immunity (Indirect Contact VCP)**

| EN 61000-4-2 Test Points<br>Location | Test Levels |       |       |       |       |       |       |       |   |
|--------------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|---|
|                                      | -2 kV       | +2 kV | -4 kV | +4 kV | -6 kV | +6 kV | -8 kV | +8 kV | X |
| Front Side                           | A           | A     | A     | A     | /     | /     | /     | /     | / |
| Back Side                            | A           | A     | A     | A     | /     | /     | /     | /     | / |
| Left Side                            | A           | A     | A     | A     | /     | /     | /     | /     | / |
| Right Side                           | A           | A     | A     | A     | /     | /     | /     | /     | / |

Test point as follows:

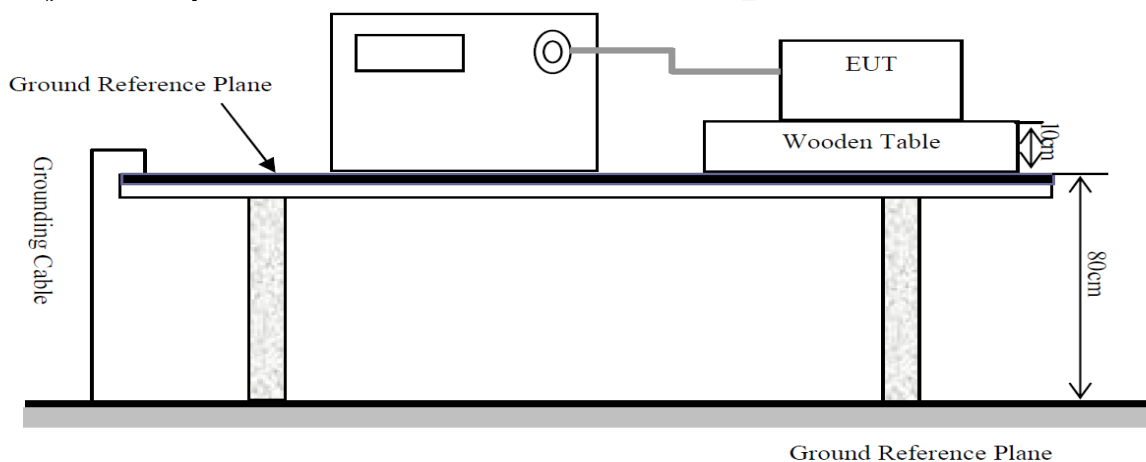


Note: "A" stands for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

**EN 55014-2 §5.2-FAST TRANSIENTS (IEC 61000-4-4)****Test Equipment**

| Manufacturer | Description             | Model      | Serial Number | Calibration Date | Calibration Due Date |
|--------------|-------------------------|------------|---------------|------------------|----------------------|
| EM TEST      | Auto Transformer        | MV2616     | V0939105172   | NCR              | NCR                  |
| EM TEST      | Ultra Compact Generator | UCS 500 N5 | P1406130994   | 2019-08-05       | 2020-08-04           |

**\* Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

**Test System Setup****Test Standard**

EN 55014-2:2015/IEC 61000-4-4:2012  
AC mains: Test level 2 at 1 kV

**Test Level**

| Open Circuit Output Test Voltage $\pm 10\%$ |                             |                           |                          |                           |
|---------------------------------------------|-----------------------------|---------------------------|--------------------------|---------------------------|
| Level                                       | Power ports, earth port(PE) |                           | Signal and control ports |                           |
|                                             | Voltage(kV)                 | Repetition frequency(kHz) | Voltage(kV)              | Repetition frequency(kHz) |
| 1                                           | 0.5                         | 5 or 100                  | 0.25                     | 5 or 100                  |
| 2                                           | 1                           |                           | 0.5                      |                           |
| 3                                           | 2                           |                           | 1                        |                           |
| 4                                           | 4                           |                           | 2                        |                           |
| X                                           | Special                     | Special                   | Special                  | Special                   |

**Performance Criterion: B**

## Test Procedure

The EUT was arranged for Power Line Coupling and for I/O Line Coupling through a capacitive clamp, where applicable. (Note: The I/O coupling test using a capacitive clamp is performed on the I/O interface cables that are longer in length than 3 meters.) A metal ground plane 2.4 meters by 2.0 meter was placed between the floor and the table and is connected to the earth by a 2.0-meter ground rod. The ground rod is connected to the test facility's electrical earth.

## Test Data

### Environmental Conditions

|                           |          |
|---------------------------|----------|
| <b>Temperature:</b>       | 24.3 °C  |
| <b>Relative Humidity:</b> | 55 %     |
| <b>ATM Pressure:</b>      | 101.2kPa |

The testing was performed by Gerry Xing on 2020-07-25.

Test mode: Normal working

| EN 61000-4-4<br>Test Points   |        | Test Levels (kV) ; Repetition frequency(5kHz) |      |      |      |      |      |      |      |
|-------------------------------|--------|-----------------------------------------------|------|------|------|------|------|------|------|
|                               |        | +0.5                                          | -0.5 | +1.0 | -1.0 | +2.0 | -2.0 | +4.0 | -4.0 |
| AC Mains Power Input<br>Ports | L      | A                                             | A    | A    | A    | /    | /    | /    | /    |
|                               | N      | A                                             | A    | A    | A    | /    | /    | /    | /    |
|                               | L-N    | A                                             | A    | A    | A    | /    | /    | /    | /    |
|                               | L-PE   | /                                             | /    | /    | /    | /    | /    | /    | /    |
|                               | N-PE   | /                                             | /    | /    | /    | /    | /    | /    | /    |
|                               | L-N-PE | /                                             | /    | /    | /    | /    | /    | /    | /    |
| Signal Port                   | /      | /                                             | /    | /    | /    | /    | /    | /    | /    |

Note: "A" stands for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

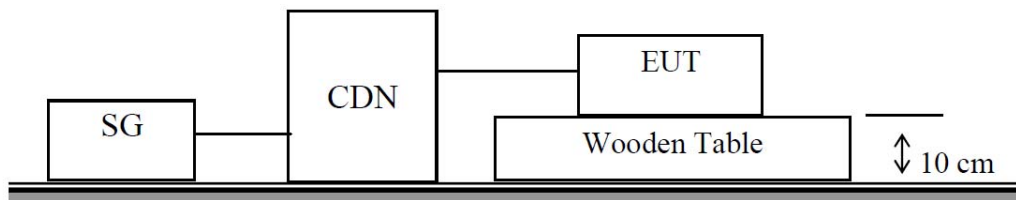
## EN 55014-2 §5.4-INJECTED CURRENTS (0.15MHZ TO 230MHZ) (IEC 61000-4-6)

### Test Equipment

| Manufacturer | Description      | Model     | Serial Number | Calibration Date | Calibration Due Date |
|--------------|------------------|-----------|---------------|------------------|----------------------|
| Agilent      | Signal Generator | 8648C     | 3537A01810    | 2019-08-05       | 2020-08-04           |
| R&S          | Power Amplifier  | 500A100M2 | 18117         | NCR              | NCR                  |
| Dressler     | Attenuator       | ATT 6/75  | 510020010004  | NCR              | NCR                  |
| COM POWER    | CDN              | CDN M225E | 511098        | 2019-08-05       | 2020-08-04           |

**\* Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

### Test Setup



### Test Standard

EN 55014-2:2015/IEC 61000-4-6:2014  
Test level 2 at 3V (r.m.s.), 0.15 MHz ~ 230 MHz

### Test Level

| Level | Voltage Level (r.m.s.) (V) |
|-------|----------------------------|
| 1     | 1                          |
| 2     | 3                          |
| 3     | 10                         |
| X     | Special                    |

### Performance Criterion: A

## Test Procedure

- 1) Let the EUT work in test mode and test it.
- 2) The EUT are placed on an insulating support 0.1 m high above a ground reference plane. CDN (coupling and decoupling device) is placed on the ground plane about 0.3 m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- 3) The disturbance signal described below is injected to EUT through CDN.
- 4) The EUT operates within its operational mode(s) under intended climatic conditions after power on.
- 5) The frequency range is swept from 150 kHz to 230 MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave.
- 6) The rate of sweep shall not exceed  $1.5 \times 10^{-3}$  decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value.
- 7) Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.

## Test Data

### Environmental Conditions

|                           |          |
|---------------------------|----------|
| <b>Temperature:</b>       | 24.3 °C  |
| <b>Relative Humidity:</b> | 55 %     |
| <b>ATM Pressure:</b>      | 101.2kPa |

The testing was performed by Gerry Xing on 2020-07-26.

Test mode: Normal working

| EN61000-4-6<br>Test Ports  | Test equipment | Frequency Range (MHz) | Voltage Level (e.m.f.) U0 |    |     |   |
|----------------------------|----------------|-----------------------|---------------------------|----|-----|---|
|                            |                |                       | 1V                        | 3V | 10V | X |
| AC mains power input ports | M2             | 0.15-80               | /                         | A  | /   | / |
| Signal Ports               | /              | /                     | /                         | /  | /   | / |

Note: "A" stands for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

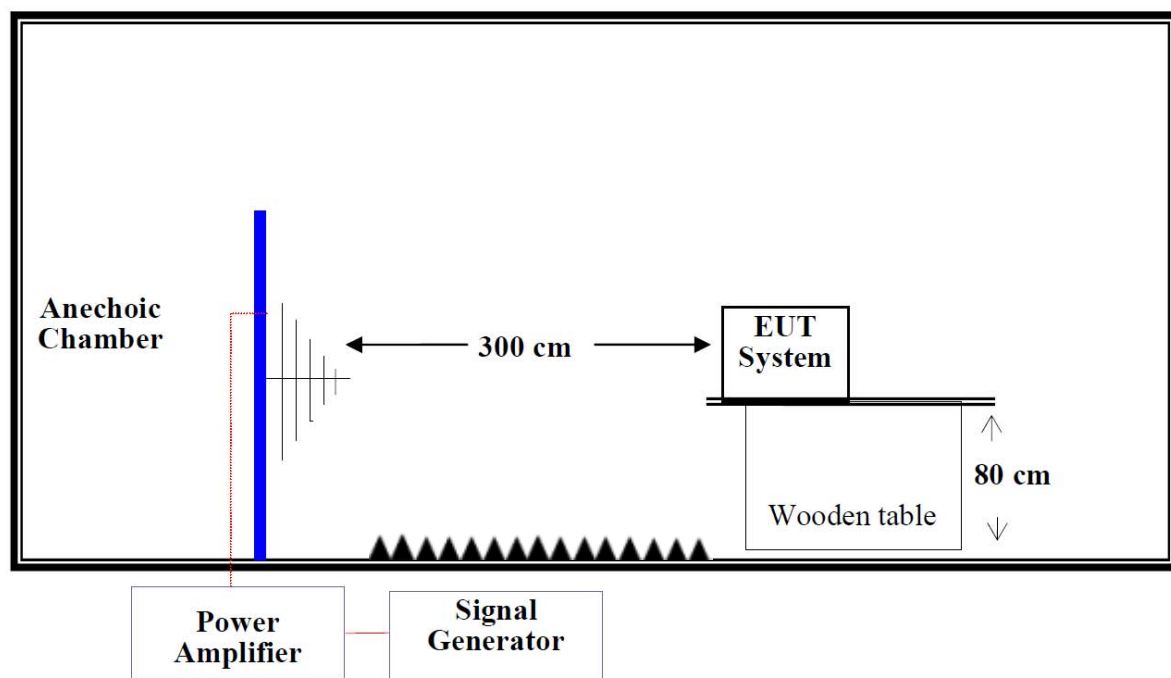
## EN 55014-2 §5.5 - RADIO FREQUENCY ELECTROMAGNETIC FIELDS (IEC 61000-4-3)

### Test Equipment

| Manufacturer       | Description          | Model       | Serial Number | Calibration Date | Calibration Due Date |
|--------------------|----------------------|-------------|---------------|------------------|----------------------|
| HP                 | Signal Generator     | E4428C      | MY49070179    | 2019-08-05       | 2020-08-04           |
| Amplifier Research | Power Amplifier      | 200W1000M3A | 18062         | NCR              | NCR                  |
| Ar                 | Log Periodic Antenna | ATL80M1G    | 350122        | NCR              | NCR                  |

**\* Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed in accordance to requirements, traceable to National Primary Standards and International System of Units (SI).

### Test System Setup



### Test Standard

EN 55014-2:2015/IEC 61000-4-3: 2006 + A2:2010  
Test level 2 at 3V/m (unmodulated, r.m.s.)

**Test Level**

| Level | Field Strength V/m |
|-------|--------------------|
| 1.    | 1                  |
| 2.    | 3                  |
| 3.    | 10                 |
| X.    | Special            |

**Performance Criterion: A****Test Procedure**

The EUT and its simulators are placed on a turn table which is 0.8 meter above the ground. The EUT is set 3 meters away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarizations of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually.

In order to judge the EUT performance, a CCD camera is used to monitor the EUT.

All the scanning conditions are as follows:

| Condition of Test          | Remarks                  |
|----------------------------|--------------------------|
| 1. Field Strength          | 3 V/m (Test level 2)     |
| 2. Radiated Signal         | AM 80%, 1 kHz Modulation |
| 3. Scanning Frequency      | 80 – 1000 MHz            |
| 4. Scanning Frequency Step | 1%                       |
| 5. Dwell Time              | 3 sec.                   |

**Test Data****Environmental Conditions**

|                           |          |
|---------------------------|----------|
| <b>Temperature:</b>       | 24.3 °C  |
| <b>Relative Humidity:</b> | 55 %     |
| <b>ATM Pressure:</b>      | 101.2kPa |

The testing was performed by Gerry Xing on 2020-07-21.

Test mode: Normal working

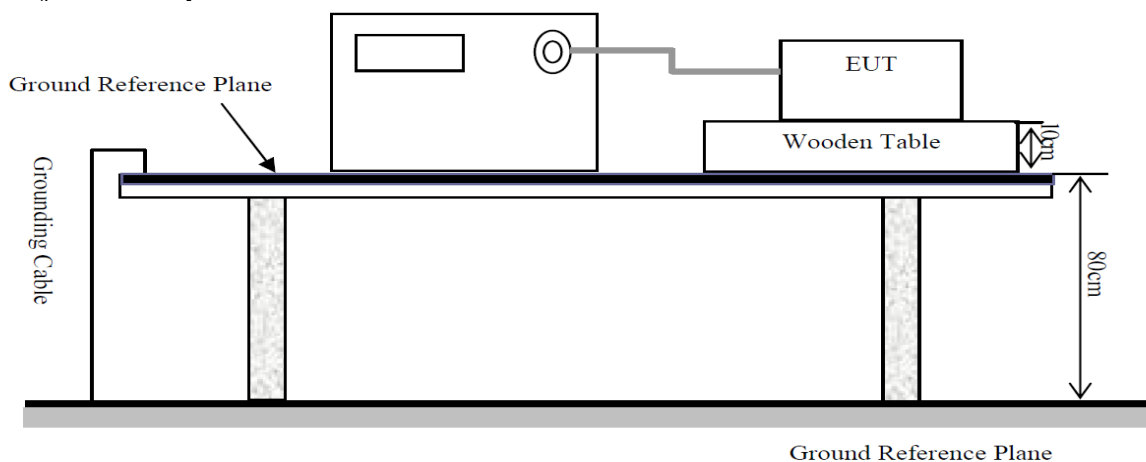
| Frequency Range (MHz) | Front Side (3V/m) |      | Rear Side (3V/m) |      | Left Side (3V/m) |      | Right Side (3V/m) |      |
|-----------------------|-------------------|------|------------------|------|------------------|------|-------------------|------|
|                       | VERT              | HORI | VERT             | HORI | VERT             | HORI | VERT              | HORI |
| 80-1000               | A                 | A    | A                | A    | A                | A    | A                 | A    |

Note: "A" stands for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

**EN 55014-2 §5.6 SURGES (IEC 61000-4-5)****Test Equipment**

| Manufacturer | Description             | Model    | Serial Number | Calibration Date | Calibration Due Date |
|--------------|-------------------------|----------|---------------|------------------|----------------------|
| EM TEST      | Auto Transformer        | MV2616   | V0939105172   | N/A              | N/A                  |
| EM TEST      | Ultra Compact Generator | UCS500-N | P1406130994   | 2019-08-05       | 2020-08-04           |

\* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**Test system Setup****Test Standard**

EN 55014-2: 2015 (IEC 61000-4-5:2014)  
AC Mains: L-N: Test level 3 at 1 kV

**Test level**

| Level | Open Circuit Output Test Voltage $\pm 10\%$ |               | Performance Criterion |             |
|-------|---------------------------------------------|---------------|-----------------------|-------------|
|       | Line - Line                                 | Line - Ground | AC Mains              | Signal Port |
| 1     | ---                                         | 0.5 kV        | ---                   | ---         |
| 2     | 0.5 kV                                      | 1 kV          | ---                   | ---         |
| 3     | 1 kV                                        | 2 kV          | B                     | ---         |
| 4     | 2 kV                                        | 4 kV          | ---                   | ---         |
| X     | Special                                     | Special       | ---                   | ---         |

**Performance Criterion: B**

## Test Procedure

- 1) Provide disturbance signal described below is injected to EUT.
- 2) 10 positive and 10 negative (polarity) tests with a maximum 1/min repetition rate are conducted during test.
- 3) Different phase angles are done individually.
- 4) Record the EUT operating situation during compliance test and decide the EUT immunity criterion for above each test.

## Test Data

### Environmental Conditions

|                           |          |
|---------------------------|----------|
| <b>Temperature:</b>       | 24.3 °C  |
| <b>Relative Humidity:</b> | 55 %     |
| <b>ATM Pressure:</b>      | 101.2kPa |

The testing was performed by Gerry Xing on 2020-07-22.

Test mode: Normal working

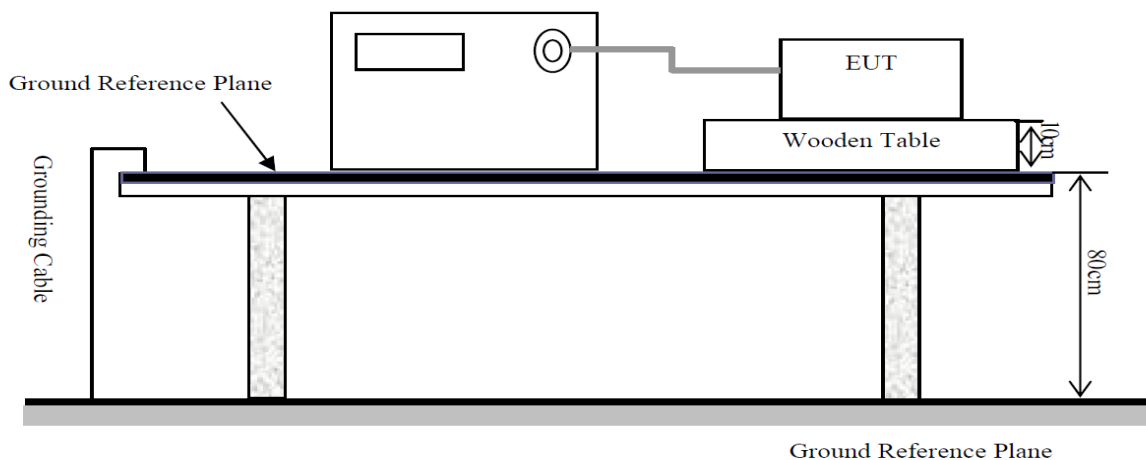
| EN61000-4-5<br>Test Points    |      | Test Levels (kV) |      |      |      |      |      |      |      |
|-------------------------------|------|------------------|------|------|------|------|------|------|------|
|                               |      | +0.5             | -0.5 | +1.0 | -1.0 | +2.0 | -2.0 | +4.0 | -4.0 |
| AC mains power<br>input ports | L-N  | A                | A    | A    | A    | /    | /    | /    | /    |
|                               | L-PE | /                | /    | /    | /    | /    | /    | /    | /    |
|                               | N-PE | /                | /    | /    | /    | /    | /    | /    | /    |

Note: "A" stands for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function, no loss of stored data or user programmable functions.

**EN 55014-2 §5.7-VOLTAGE DIPS AND INTERRUPTIONS (IEC 61000-4-11)****Test Equipment**

| Manufacturer | Description             | Model     | Serial Number | Calibration Date | Calibration Due Date |
|--------------|-------------------------|-----------|---------------|------------------|----------------------|
| EM TEST      | Auto Transformer        | MV2616    | V0939105172   | N/A              | N/A                  |
| EM TEST      | Ultra Compact Generator | UCS500-N5 | P1406130994   | 2019-08-05       | 2020-08-04           |

\* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**Test setup****Test Standard**

EN 55014-2: 2015 (IEC 61000-4-11:2004)  
Test levels and Performance Criterion

**Test Levels and Performance Criterion**

| Test Level                          | Td (Periods) | Phase Angle      | Performance criterion |
|-------------------------------------|--------------|------------------|-----------------------|
| Voltage dip : 0 % residual voltage  | 0.5          | 0°/90°/180°/270° | C                     |
| Voltage dip : 40 % residual voltage | 10           | 0°/90°/180°/270° | C                     |
| Voltage dip : 70 % residual voltage | 25           | 0°/90°/180°/270° | C                     |

**Test Procedure**

- 1) The interruption is introduced at selected phase angles with specified duration.
- 2) Record any degradation of performance.

**Test Data****Environmental Conditions**

|                           |          |
|---------------------------|----------|
| <b>Temperature:</b>       | 24.3 °C  |
| <b>Relative Humidity:</b> | 55 %     |
| <b>ATM Pressure:</b>      | 101.2kPa |

*The testing was performed by Gerry Xing on 2020-07-22.*

*Test mode: Normal working*

| Test Level                          | Td (Periods) | Phase Angle      | Result |
|-------------------------------------|--------------|------------------|--------|
| Voltage dip : 0 % residual voltage  | 0.5          | 0°/90°/180°/270° | A      |
| Voltage dip : 40 % residual voltage | 10           | 0°/90°/180°/270° | A      |
| Voltage dip : 70 % residual voltage | 25           | 0°/90°/180°/270° | A      |

Note:

“A” stand for, during test, operate as intended no loss of function, no degradation of performance, no unintentional transmissions and after test, no degradation of performance, no loss of function or user programmable functions.

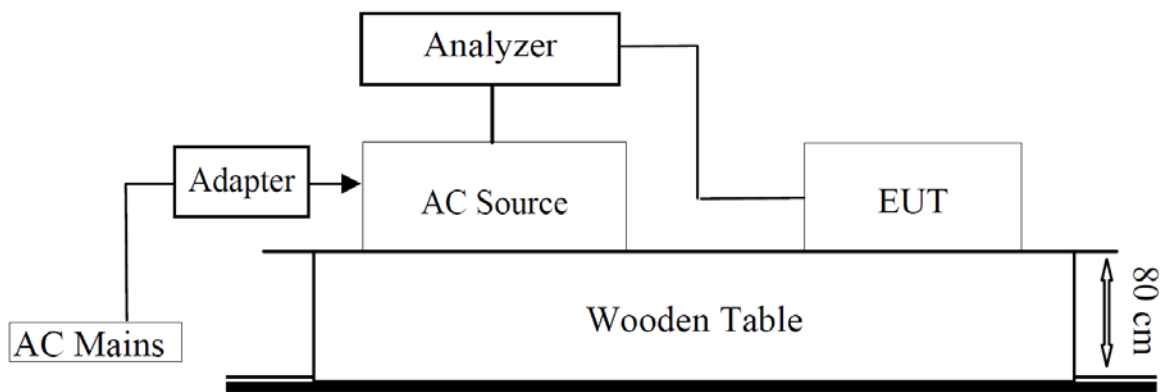
## EN 61000-3-3 VOLTAGE FLUCTUATIONS AND FLICKER

### Test Equipment

| Manufacturer | Description                 | Model    | Serial Number | Calibration Date | Calibration Due Date |
|--------------|-----------------------------|----------|---------------|------------------|----------------------|
| EM TEST      | Harmonic & Flicker Analyzer | DPA 500N | P1402129120   | 2019-11-30       | 2020-11-29           |
| EM TEST      | AC Power Source             | ACS 500N | P1251107475   | 2019-11-30       | 2020-11-29           |

\* Statement of Traceability: Bay Area Compliance Laboratories Corp. (Kunshan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

### Test System Setup



### Test Standard

EN 61000-3-3:2013+A1:2019

### Flicker Test Limits

The limits shall be applicable to voltage fluctuations and flicker at the supply terminals of the equipment under test, measured or calculated according to clause 4 under test conditions described in clause 6 and annex A. Tests made to prove compliance with the limits are considered to be type tests.

The following limits apply:

- the value of Pst shall not be greater than 1,0;
- the value of Plt shall not be greater than 0,65;
- Tmax, the accumulated time value of d(t) with a deviation exceeding 3,3 % during a single voltage change at the EUT terminals, shall not exceed 500 ms;
- the relative steady-state voltage change, dc, shall not exceed 3,3 %;
- the maximum relative voltage change dmax, shall not exceed
  - a) 4 % without additional conditions;
  - b) 6 % for equipment which is:

Switched manually, or

- switched automatically more frequently than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds), or manual restart, after a power supply interruption.

Note: The cycling frequency will be further limited by the Pst and Plt limit. For example: a  $d_{max}$  of 6 % producing a rectangular voltage change characteristic twice per hour will give a Plt of about 0,65.

c) 7 % for equipment which is - attended whilst in use (for example: hair dryers, vacuum cleaners, kitchen equipment such as mixers, garden equipment such as lawn mowers, portable tools such as electric drills), or  
– switched on automatically, or is intended to be switched on manually, no more than twice per day, and also has either a delayed restart (the delay being not less than a few tens of seconds) or manual restart, after a power supply interruption.

In the case of equipment having several separately controlled circuits in accordance with 6.6, limits b) and c) shall apply only if there is delayed or manual restart after a power supply interruption; for all equipment with automatic switching which is energized immediately on restoration of supply after a power supply interruption, limits a) shall apply; for all equipment with manual switching, limits b) or c) shall apply depending on the rate of switching. Pst and Plt requirements shall not be applied to voltage changes caused by manual switching. The limits shall not be applied to voltage changes associated with emergency switching or emergency interruptions.

## Test Data

### Environmental Conditions

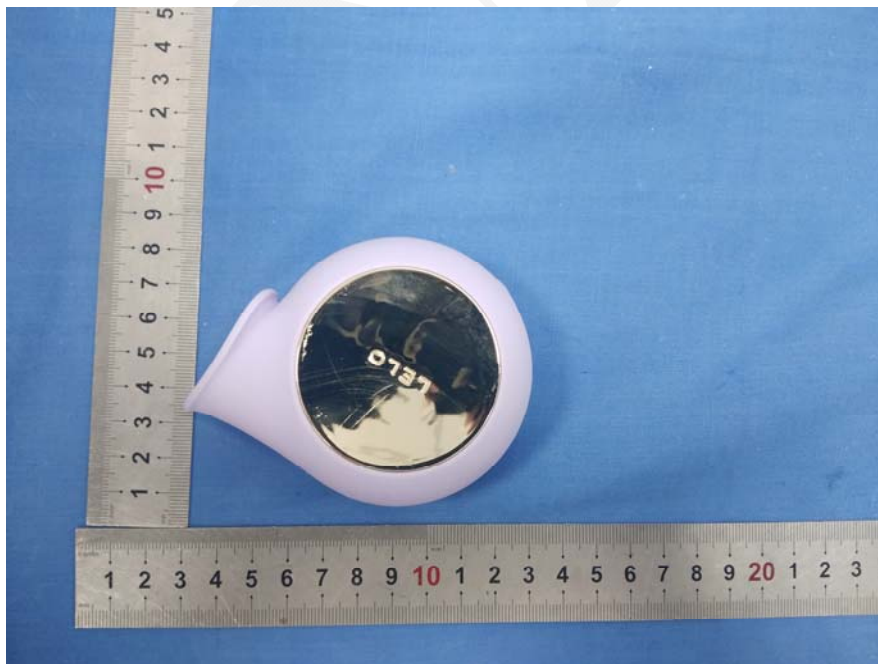
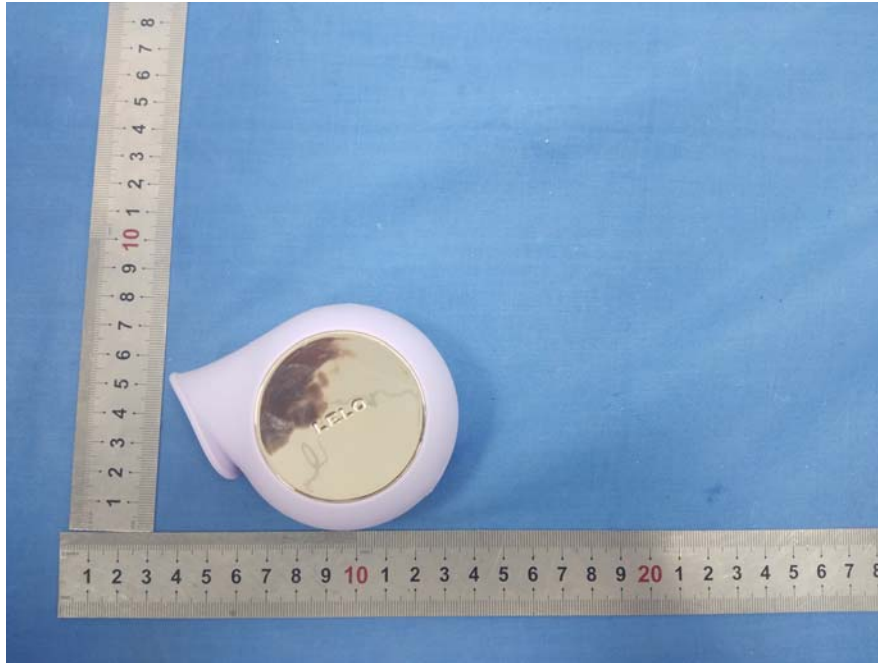
|                           |          |
|---------------------------|----------|
| <b>Temperature:</b>       | 26.3 °C  |
| <b>Relative Humidity:</b> | 55 %     |
| <b>ATM Pressure:</b>      | 101.2kPa |

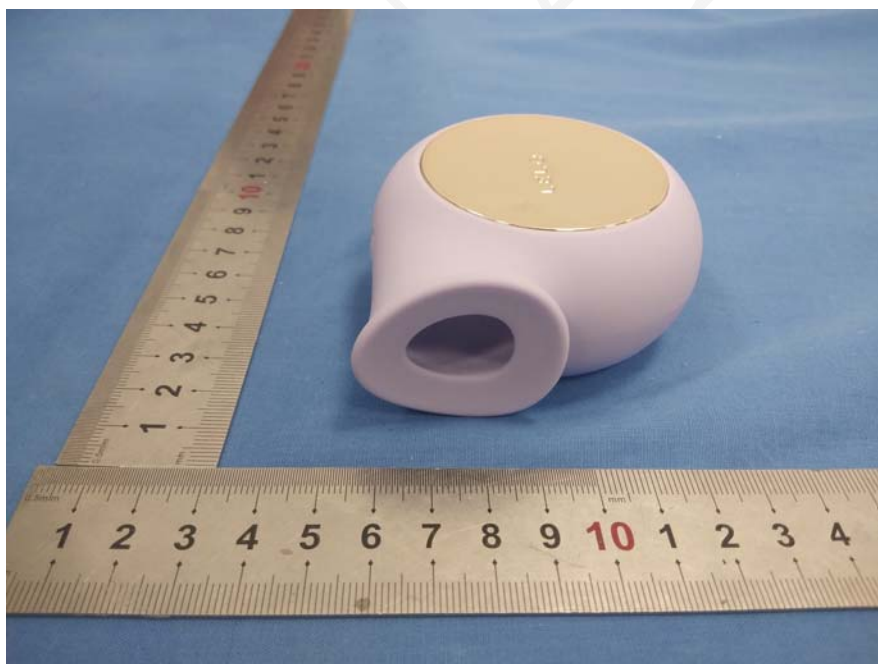
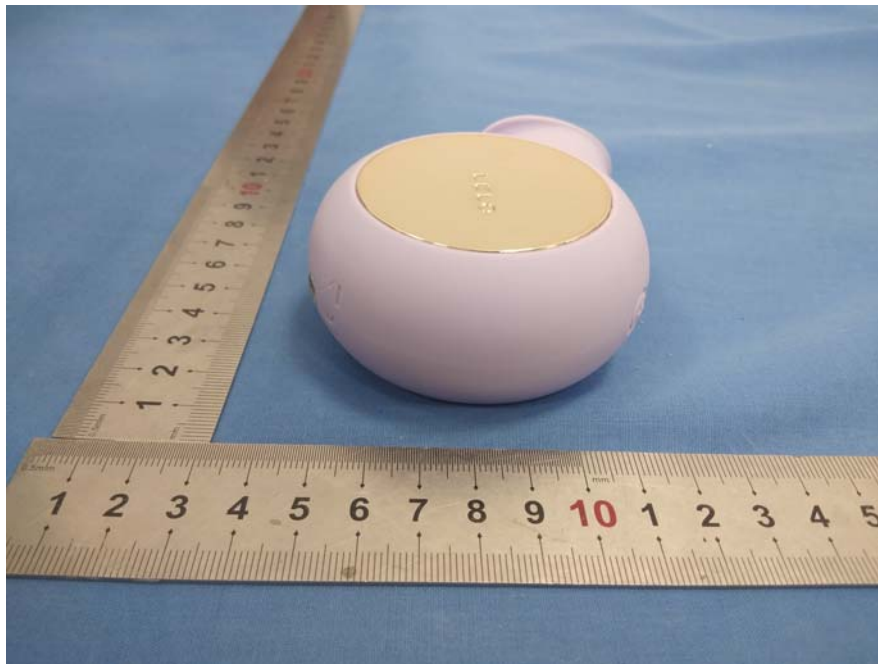
|                           |                                           |
|---------------------------|-------------------------------------------|
| <b>Date of test:</b>      | 13:14 26.Jul 2020                         |
| <b>Tester:</b>            | Gerry Xing                                |
| <b>Standard used:</b>     | EN/IEC 61000-3-3 Flicker                  |
| <b>Short time (Pst):</b>  | 10 min                                    |
| <b>Observation time:</b>  | 120 min (12 Flicker measurement)          |
| <b>Flicker meter:</b>     | 230V / 50Hz according IEC 61000-4-15 Ed.2 |
| <b>Flicker Impedance:</b> | Zref (IEC 60725)                          |
| <b>Customer:</b>          | SUZHOU ARMOCON TECHNOLOGY CO.,LTD         |
| <b>E. U. T.:</b>          | Hand held massage                         |
| <b>Model:</b>             | Sila                                      |
| <b>EUT operation mode</b> | <i>Normal working</i>                     |

**Maximum Flicker results**

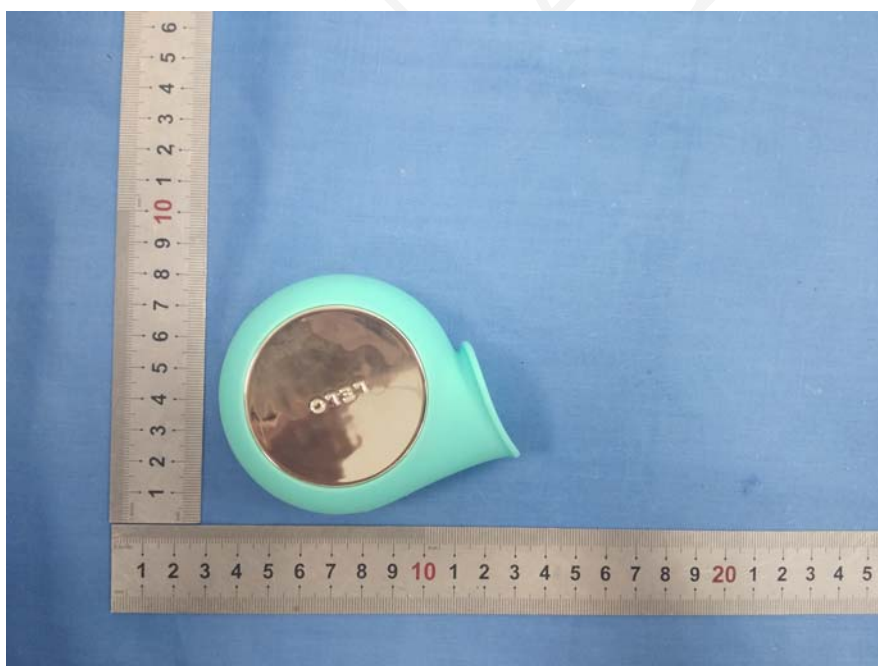
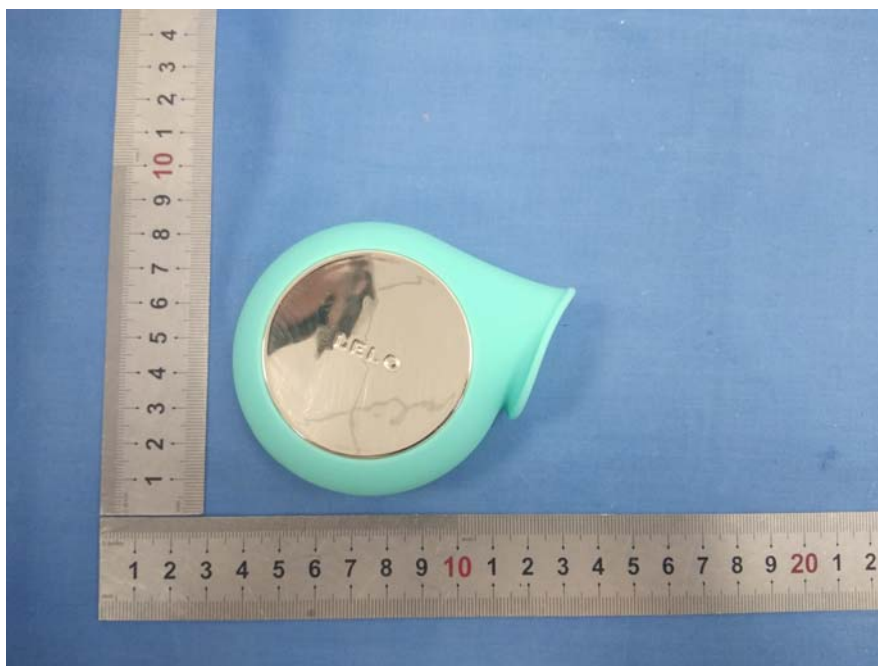
|                 | <b>EUT values</b> | <b>Limit</b> | <b>Result</b> |
|-----------------|-------------------|--------------|---------------|
| <b>Pst</b>      | 0.031             | 1.00         | Pass          |
| <b>Plt</b>      | 0.032             | 0.65         | Pass          |
| <b>dc [%]</b>   | 0.000             | 3.30         | Pass          |
| <b>dmax [%]</b> | 0.198             | 7.00         | Pass          |
| <b>Tmax [s]</b> | 0.000             | 0.50         | Pass          |

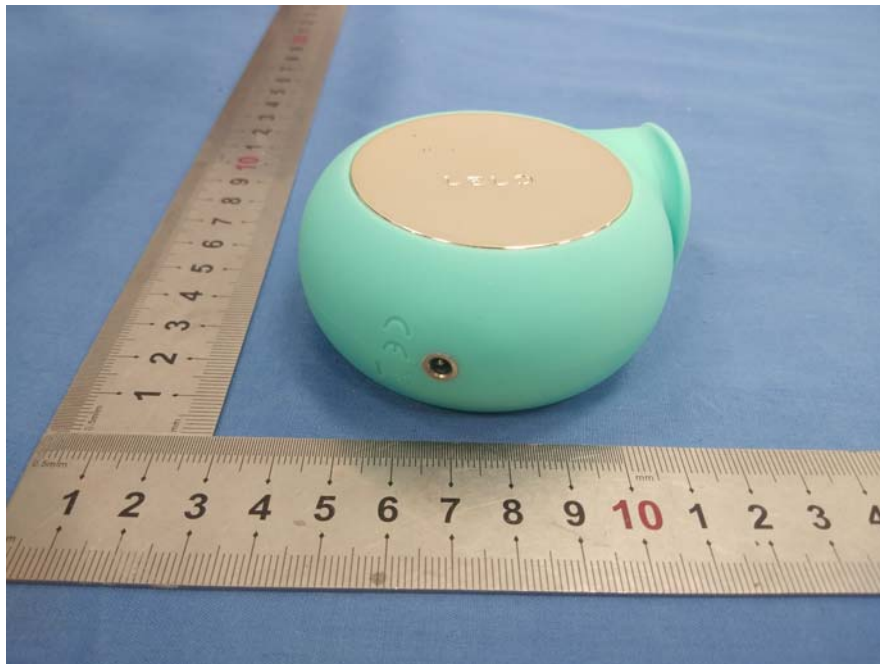
## EXHIBIT A - EUT PHOTOGRAPHS

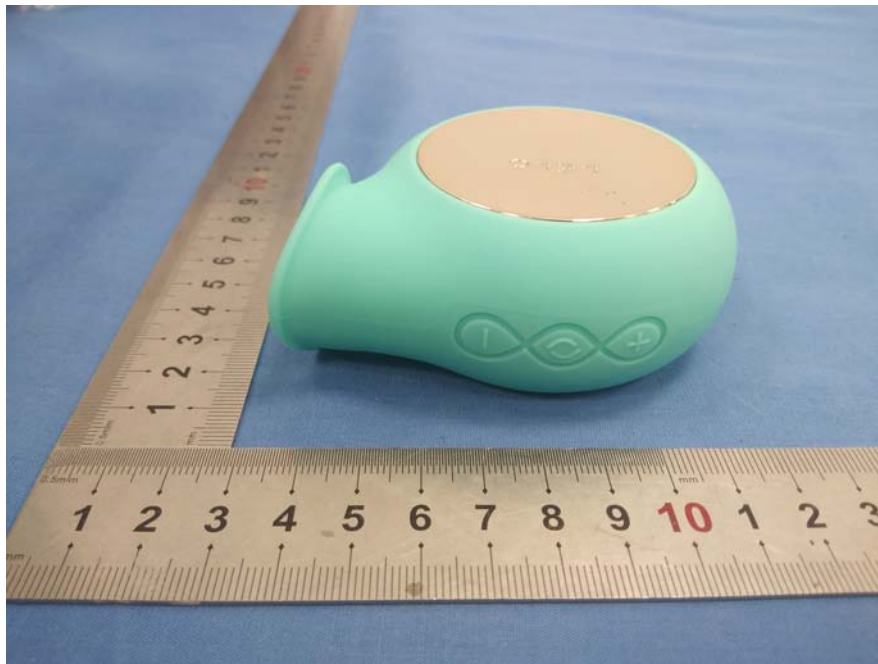


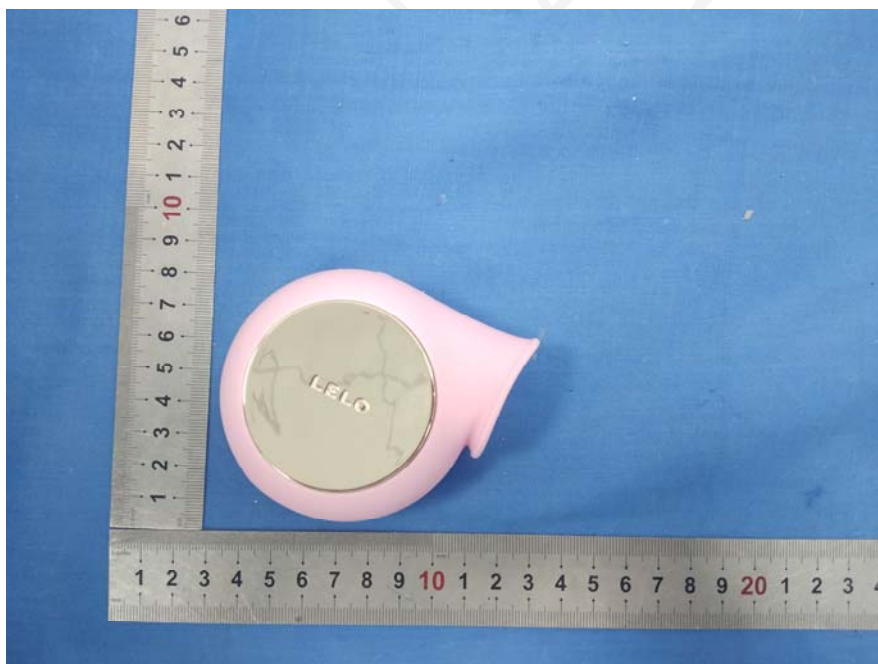
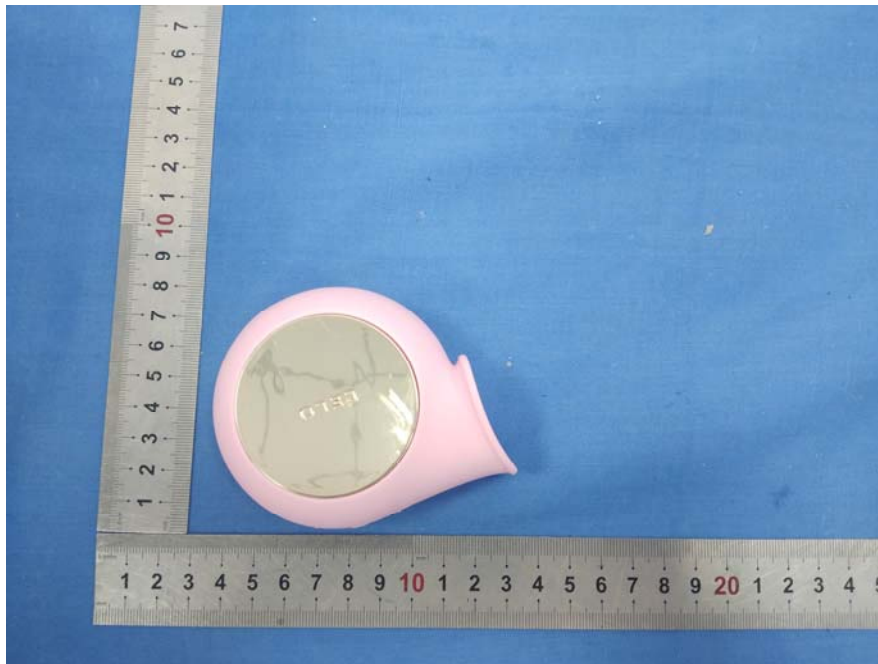


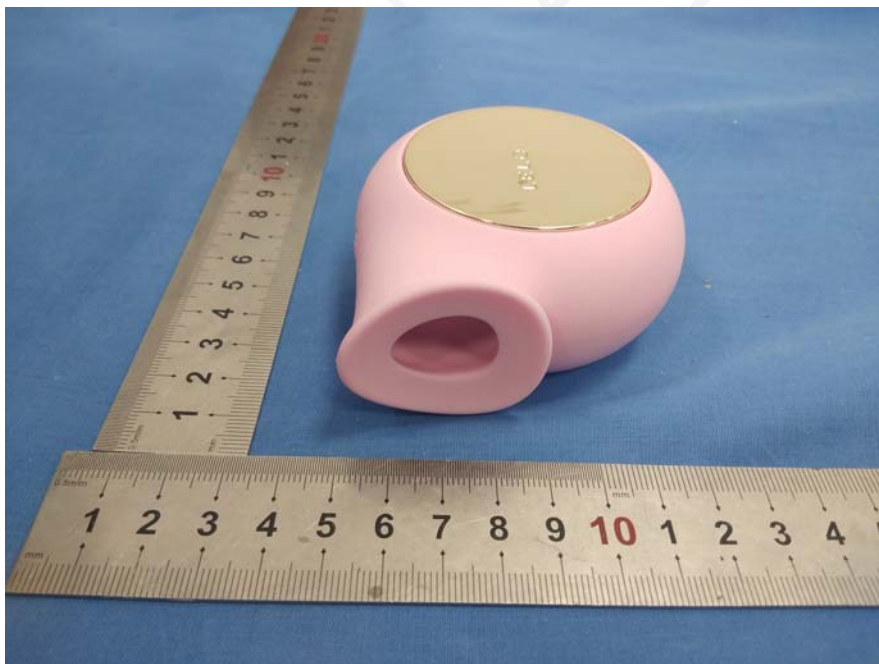




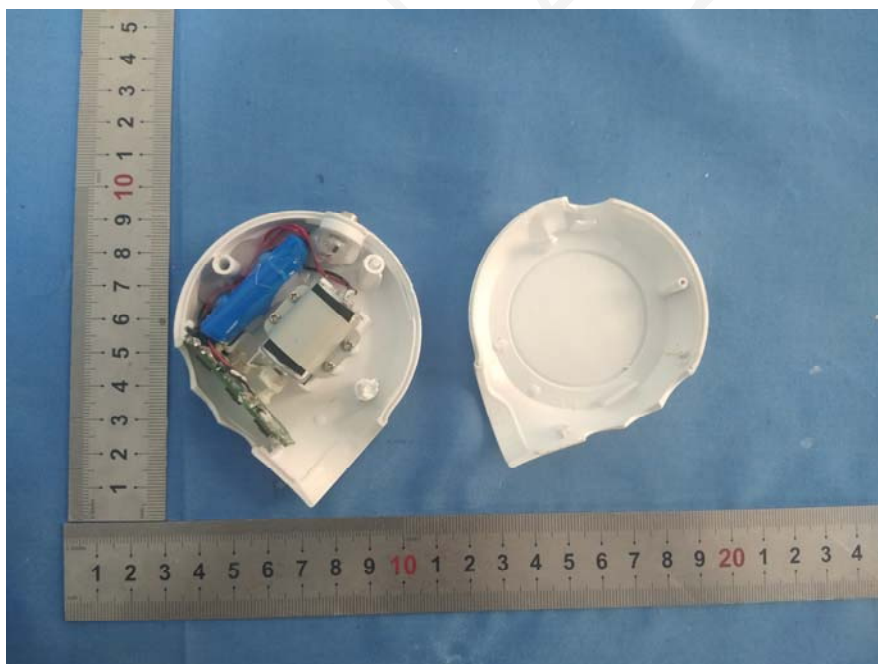


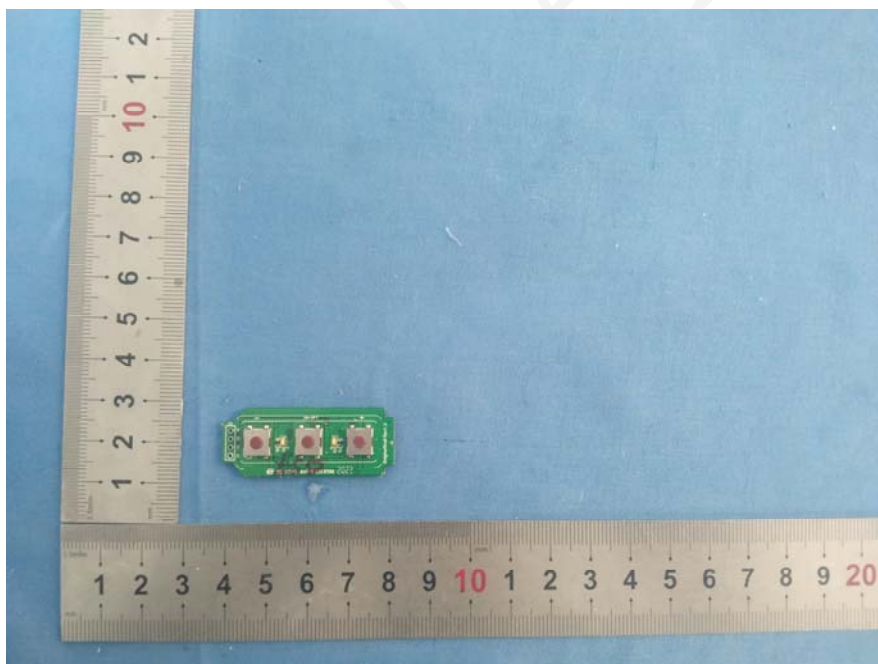
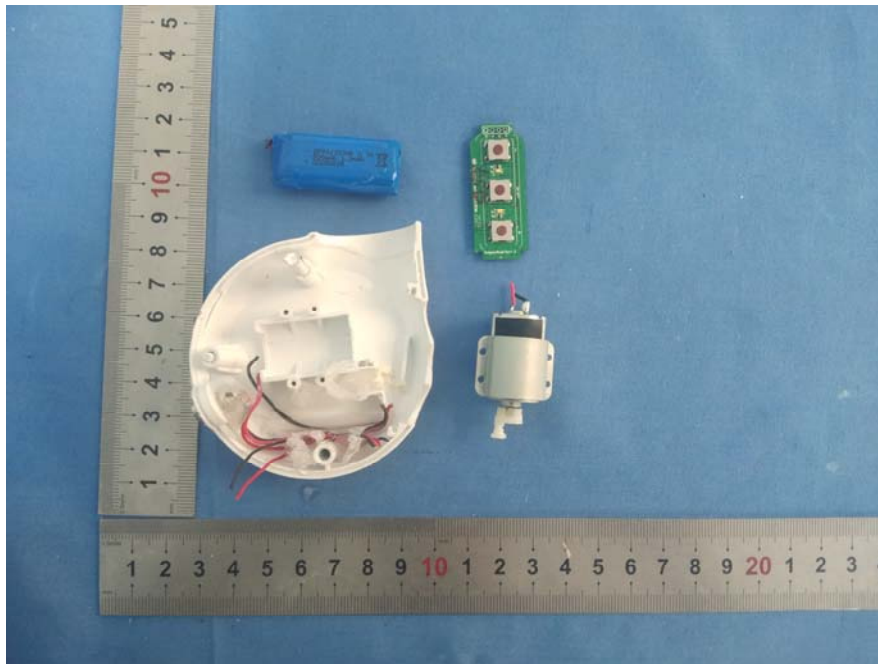


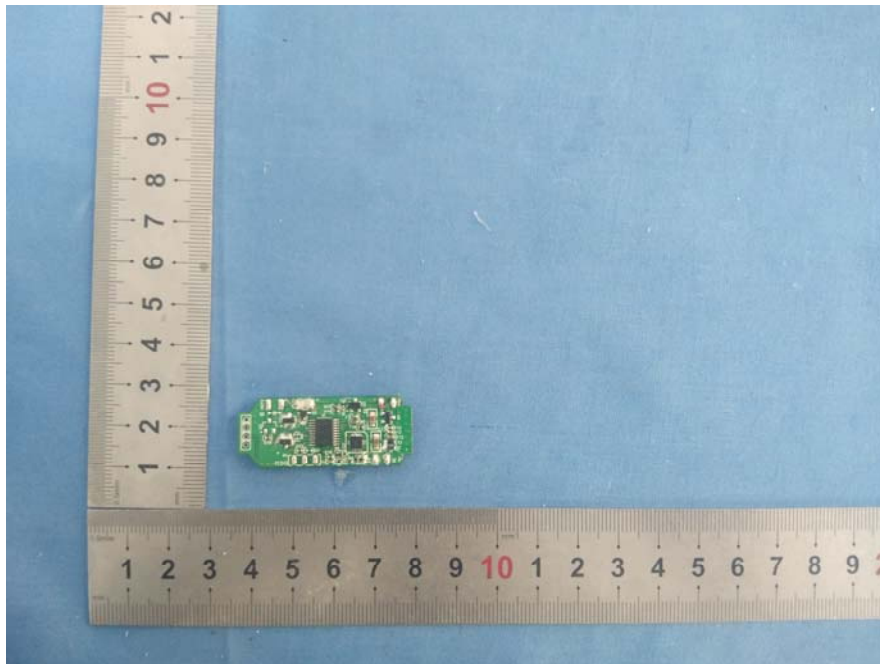


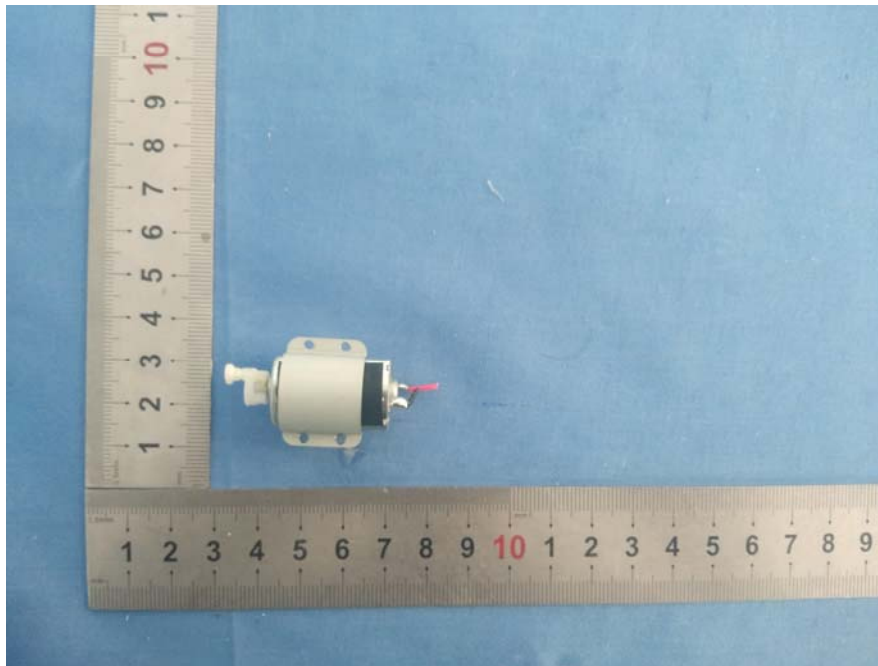












## EXHIBIT B - TEST SETUP PHOTOGRAPHS

**Terminal Voltage - Front Side**



**Terminal Voltage - Rear Side**



**Radiated Disturbance - Front View (Below 1GHz)**



**Radiated Disturbance - Rear View (Below 1GHz)**



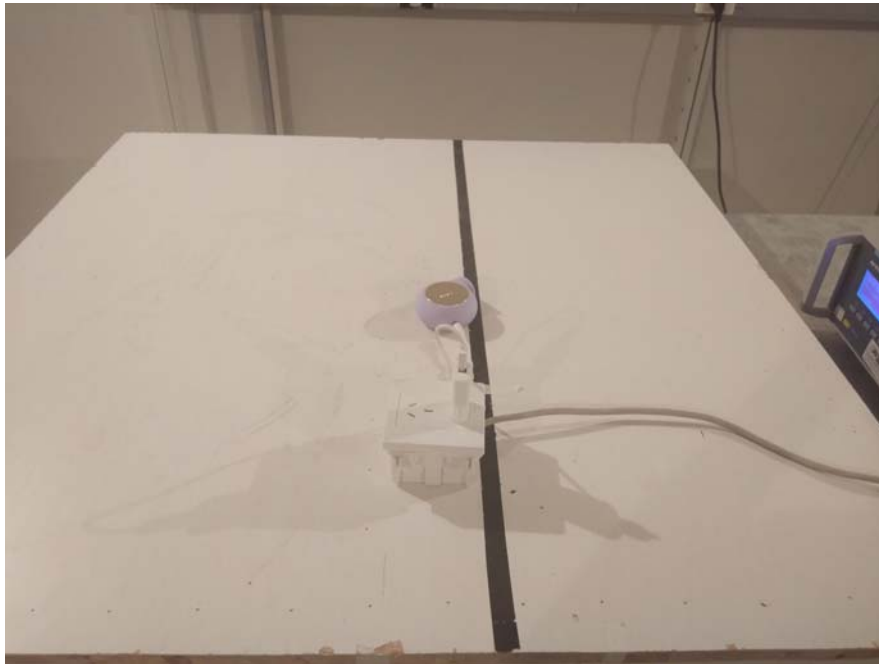
### Flicker Test Setup Photo



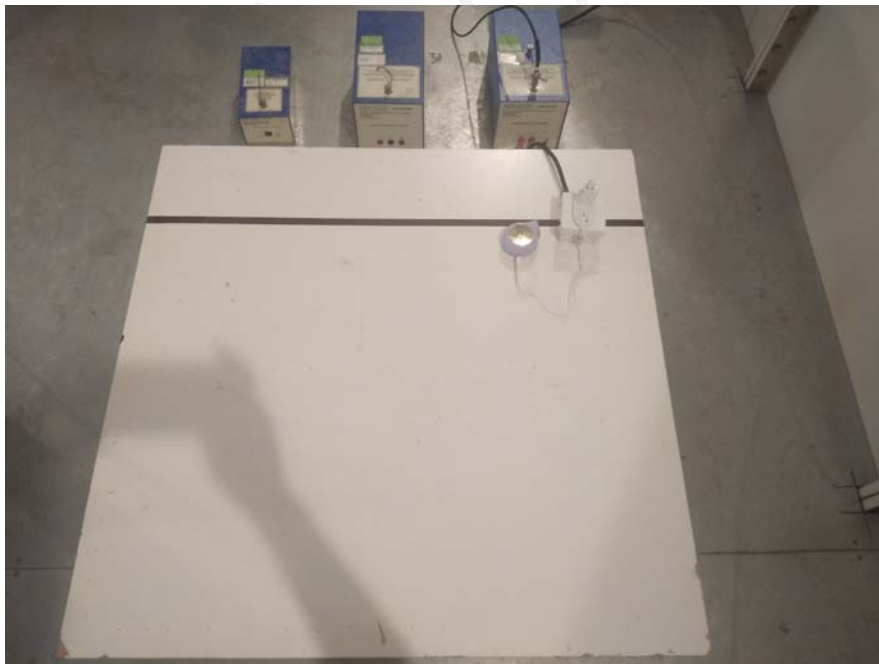
### ESD Test Setup Photo



**EFT Test Setup Photo**



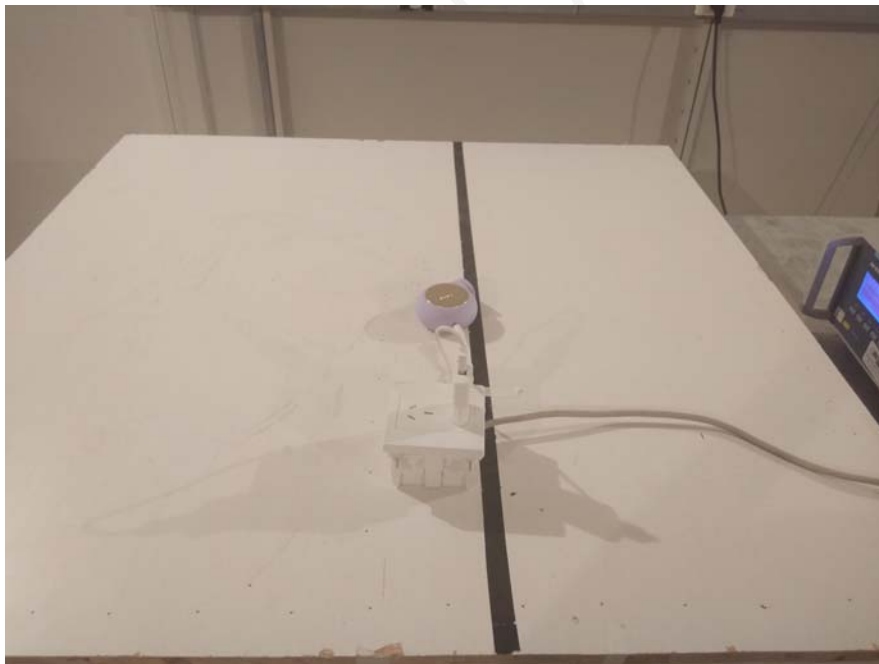
**CS Test Setup Photo**



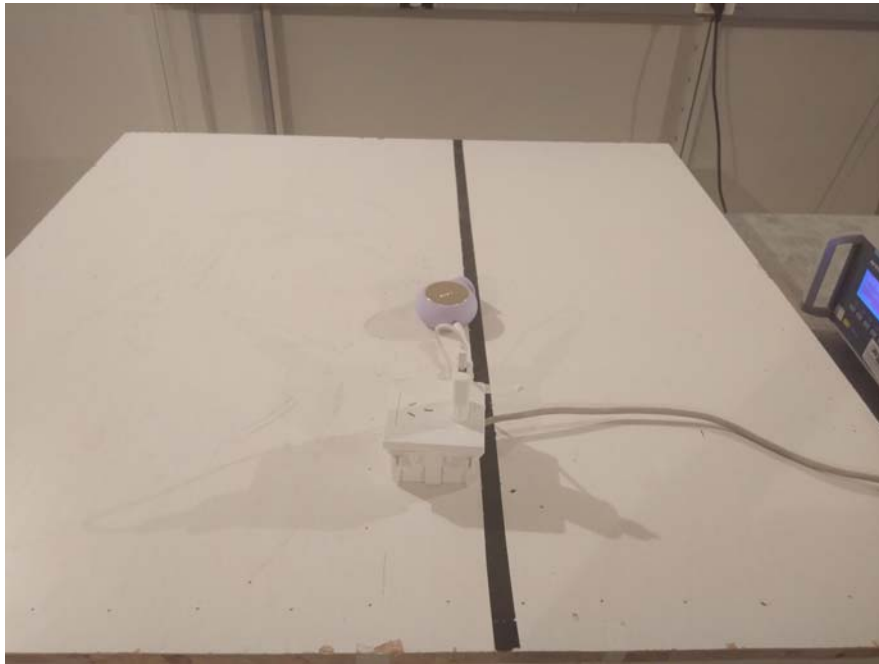
**RS Test Setup Photo(Below 1GHz)**



**Surges Test Setup Photo**



### Dips Test Setup Photo



## Declarations

1: BACL is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk '\*'. Customer model name, addresses, names, trademarks etc. are not considered data.

2: Unless otherwise stated the results shown in this test report refer only to the sample(s) tested.

3: Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

4: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval.

5: This report cannot be reproduced except in full, without prior written approval of the Company.

6: This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

**\*\*\*\*END OF REPORT\*\*\*\***