

# Radio Exposure Evaluation Report

FCC ID : 2AIBX-NIULL

Equipment : NIUL

Brand Name : Electrolux

Model Name : NIU-LIGHT

Applicant/ : Electrolux Italia S.p.A.

Manufacturer : Corso Lino Zanussi 24 / 33080 Porcia (PN), Italy

Factory : LITE-ON Technology (Changzhou) CO.LTD  
A9 Building, No.88 Yanghu Road, Wujin Hi-Tech  
Industrial Development Zone, Changzhou City,  
Jiangsu Province 213100 China

Standard : 47 CFR FCC Part 2 Subpart J, section 2.1091

The product was received on Jun. 18, 2021, and testing was started from Jul. 09, 2021 and completed on Jul. 09, 2021. We, SPORTON INTERNATIONAL INC. Hsinhua Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR FCC Part 2 Subpart J, section 2.1091 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. Hsinhua Laboratory, the test report shall not be reproduced except in full.



Approved by: Allen Lin

**SPORTON INTERNATIONAL INC. Hsinhua Laboratory**  
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### Photographs of EUT V01



TEL : 886-3-327-3456  
FAX : 886-3-327-0973  
Report Template No.: HE1-A1 Ver4.0  
FCC ID: 2AIBX-NIULL



## Summary of Test Result

| Report Clause | Ref Std. Clause | Test Items          | Result (PASS/FAIL) | Remark |
|---------------|-----------------|---------------------|--------------------|--------|
| 2             | -               | Exposure evaluation | PASS               | -      |

**Declaration of Conformity:**

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

**Comments and Explanations:**

None

**Reviewed by:** Howard Lee

**Report Producer:** Amber Chiu

# 1 General Description

## 1.1 Information

### 1.1.1 EUT General Information

| RF General Information |                       |                           |                                                                                 |
|------------------------|-----------------------|---------------------------|---------------------------------------------------------------------------------|
| Evaluation Mode        | Frequency Range (MHz) | Operating Frequency (MHz) | Modulation Type                                                                 |
| 2.4GHz WLAN            | 2400-2483.5           | 2412-2462                 | 802.11b: DSSS (DBPSK, DQPSK, CCK)<br>802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) |

### 1.1.2 Antenna Information

| Ant. | Brand  | Model Name | Antenna Type    | Connector | Gain (dBi) |
|------|--------|------------|-----------------|-----------|------------|
| 1    | LITEON | WN3602M    | Printed Antenna | Murata    | -0.9       |

Note 1: The EUT has one antenna.

#### For 2.4GHz function:

For IEEE 802.11 b/g/n mode (1TX/1RX)

Ant. 1 can be used as transmitting/receiving antenna.

### 1.1.3 Table for Multiple Listing

The EUT in the following table are all refer to the identical product.

| EUT No. | Model     | Voltage |
|---------|-----------|---------|
| 1       | NIU-LIGHT | 3.3V    |
| 2       | NIU-LIGHT | 5V      |

Note.1: The test voltage 3.3V and 5V configuration was pretested and 3.3V was found to be the worst case for conducted test.

## 1.2 Testing Location

| Test Lab. : Sporton International Inc. Hsinhua Laboratory |                             |                                                                                                                                                                                  |
|-----------------------------------------------------------|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input checked="" type="checkbox"/>                       | Hsinhua<br>(TAF: 3785)      | ADD: No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)<br>TEL: 886-3-327-3456 FAX: 886-3-327-0973<br>Test site Designation No. TW3785 with FCC.          |
| <input type="checkbox"/>                                  | Wen 33rd.St.<br>(TAF: 3785) | ADD: No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)<br>TEL: 886-3-318-0787 FAX: 886-3-318-0287<br>Test site Designation No. TW0008 with FCC. |

## 2 Maximum Permissible Exposure

### 2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/ cm <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|------------------------------------------|------------------------------------------------------------------|
| 0.3-3.0               | 614                               | 1.63                              | (100)*                                   | 6                                                                |
| 3.0-30                | 1842 / f                          | 4.89 / f                          | (900 / f <sup>2</sup> )*                 | 6                                                                |
| 30-300                | 61.4                              | 0.163                             | 1.0                                      | 6                                                                |
| 300-1500              | -                                 | -                                 | F/300                                    | 6                                                                |
| 1500-100,000          | -                                 | -                                 | 5                                        | 6                                                                |

(B) Limits for General Population / Uncontrolled Exposure

| Frequency Range (MHz) | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/ cm <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|------------------------------------------|------------------------------------------------------------------|
| 0.3-1.34              | 614                               | 1.63                              | (100)*                                   | 30                                                               |
| 1.34-30               | 824/f                             | 2.19/f                            | (180/f <sup>2</sup> )*                   | 30                                                               |
| 30-300                | 27.5                              | 0.073                             | 0.2                                      | 30                                                               |
| 300-1500              | -                                 | -                                 | F/1500                                   | 30                                                               |
| 1500-100,000          | -                                 | -                                 | 1.0                                      | 30                                                               |

Note: f = frequency in MHz ; \*Plane-wave equivalent power density

### 2.2 MPE Calculation Method

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

**E** = Electric field (V/m)

**P** = RF output power (W)

**G** = EUT Antenna numeric gain (numeric)

**d** = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$



## 2.3 Calculated Result and Limit

### Exposure Environment: General Population / Uncontrolled Exposure

| Mode     | DG<br>(dBi) | Power<br>(dBm) | EIRP<br>(dBm) | Tolerance<br>(dB) | Tune-up<br>EIRP<br>(dBm) | Tune-up<br>EIRP<br>(W) | Distance<br>(cm) | S<br>(mW/cm <sup>2</sup> ) | S Limit<br>(mW/cm <sup>2</sup> ) |
|----------|-------------|----------------|---------------|-------------------|--------------------------|------------------------|------------------|----------------------------|----------------------------------|
| 2.4G;G1D | -0.90       | 20.06          | 19.16         | 0.50              | 19.66                    | 0.09247                | 20               | 0.01840                    | 1.00000                          |
| 2.4G;D1D | -0.90       | 21.70          | 20.80         | 0.50              | 21.30                    | 0.13490                | 20               | 0.02684                    | 1.00000                          |

————THE END————