

BS EN IEC 62311:2020  
ASSESSMENT REPORT

For

**Shenzhen Sonoff Technologies Co.,Ltd.**

3F & 6F, Bldg A, No. 663, Bulong Rd, Shenzhen, Guangdong, China

**Tested Models: M5-3C-80**  
**Multiple Models: M5-1C-80W, M5-2C-80W,**  
**M5-3C-80W, M5-1C-80G, M5-2C-80G, M5-3C-80G, M5-**  
**2C-80, M5-1C-80**

|  |   |
|--|---|
| <b>Report Type:</b><br>Original Report | <b>Product Type:</b><br>SONOFF SwitchMan Smart Wall<br>Switch   |
| <b>Report Number:</b>                  | DG1220822-38175EA2  |
| <b>Report Date:</b>                    | 2022-08-24  |
| <b>Reviewed By:</b>                    | Rocky Xiao<br>RF Engineer   |
| <b>Test Laboratory:</b>                | Bay Area Compliance Laboratories Corp. (Dongguan)<br>No.12, Pulong East 1 <sup>st</sup> Road, Tangxia Town, Dongguan,<br>Guangdong, China<br>Tel: +86-769-86858888<br>Fax: +86-769-86858891<br><a href="http://www.baclcorp.com.cn">www.baclcorp.com.cn</a> |

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## GENERAL INFORMATION

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

|                             |  |
|-----------------------------|--|
| <b>EUT Name:</b>            | SONOFF SwitchMan Smart Wall Switch   |
| <b>Tested Models:</b>       | M5-3C-80   |
| <b>Multiple Models:</b>     | M5-1C-80W, M5-2C-80W, M5-3C-80W,<br>M5-1C-80G, M5-2C-80G, M5-3C-80G,<br>M5-2C-80, M5-1C-80 |
| <b>Model Difference:</b>    | Refer to DOS   |
| <b>Rated Input Voltage:</b> | AC230V   |
| <b>Serial Number:</b>       | DG1220822-38175E-RF-A2-S1  |
| <b>EUT Received Date:</b>   | 2022-08-22   |
| <b>EUT Received Status:</b> | Good   |

### Objective

This report is prepared on behalf of *Shenzhen Sonoff Technologies Co.,Ltd.* in accordance with BS EN IEC 62311:2020, Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz to 300 GHz).

The objective is to determine the compliance of EUT with BS EN IEC 62311:2020.

### Test Methodology

All measurements contained in this report were conducted with BS EN IEC 62311:2020.

### Declarations

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 a triangle symbol “▲”. Customer model name, addresses, names, trademarks etc. are not considered data.

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

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

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

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## Technical Requirements Specification in BS EN IEC 62311

### General Description of Applied Standards

In general, the basic restrictions shall be used as exposure limits for the assessment of compliance. However, in most cases reference levels are used as limits. Such reference levels for exposure to electric, magnetic and electromagnetic fields are derived from the basic restrictions using realistic worst-case assumptions about exposure. If the reference levels are met, then the basic restrictions will also be met; if the reference levels are exceeded, that does not necessarily mean that the basic restrictions are exceeded. In some situations, it may be possible to show compliance with the basic restrictions directly. It may also be possible to derive compliance criteria that allow a simple measurement or calculation to demonstrate compliance with the basic restrictions. Often these compliance criteria can be derived using realistic assumptions about conditions under which exposures from a device may occur, rather than the conservative assumptions that are the basis for the reference levels.

### RF Exposure Evaluation

#### Limit:

According to BS EN IEC 62311, the criteria listed in the below table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified table 2 of Council Recommendation 1999/519/EC.

Reference levels for electric, magnetic and electromagnetic fields  
(0 Hz to 300 GHz, unperturbed rms values)

| Frequency range | E-field strength<br>(V/m) | H-field strength<br>(A/m) | B-field( $\mu$ T)   | Equivalent plane<br>wave power density<br>$S_{eq}$ (W/m <sup>2</sup> ) |
|-----------------|---------------------------|---------------------------|---------------------|--|
| 0-1 Hz          | -                         | $3,2 \times 10^4$         | $4 \times 10^4$     | -  |
| 1-8 Hz          | 10 000                    | $3,2 \times 10^4/f^2$     | $4 \times 10^4/f^2$ | -  |
| 8-25 Hz         | 10 000                    | 4 000/f                   | 5 000/f             | -  |
| 0,025-0,8 kHz   | 250/f                     | 4/f                       | 5/f                 | -  |
| 0,8-3 kHz       | 250/f                     | 5                         | 6,25                | -  |
| 3-150 kHz       | 87                        | 5                         | 6,25                | -  |
| 0,15-1 MHz      | 87                        | 0,73/f                    | 0,92/f              | -  |
| 1-10 MHz        | $87/f^{1/2}$              | 0,73/f                    | 0,92/f              | -  |
| 10-400 MHz      | 28                        | 0,073                     | 0,092               | 2  |
| 400-2 000 MHz   | $1,375 f^{1/2}$           | $0,0037 f^{1/2}$          | $0,0046 f^{1/2}$    | f/200  |
| 2-300 GHz       | 61                        | 0,16                      | 0,20                | 10   |

Notes:

1. f as indicated in the frequency range column.

**Test method**

**Far Field**

The antenna of the product, under normal use condition is at least 20cm away from the body of the user. So, this product under normal use is located on electromagnetic far field between the human body.

**Far Field Calculation Formula**

$$E = \frac{\sqrt{30PG(\theta, \phi)}}{r}$$

Where:

P= Tune-up average conducted power

G= antenna gain relative to an isotropic antenna

$\theta, \phi$ = elevation and azimuth angles to point of investigation

r= distance from observation point to the antenna

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{E_i}{E_{Limit, i}} \leq 1$$

**Equivalent plane wave power density:**

**Equivalent plane wave power density Seq Calculation Formula**

Power density Seq= PG/(4 π r<sup>2</sup>)

Where:

P= Tune-up average conducted power

G= antenna gain relative to an isotropic antenna

r= distance from observation point to the antenna

**Test Data(Far Field Calculation)**

| RF Mode | Frequency<br>(MHz) | Tune-up EIRP<br>Power<br>(dBm) | E-Field<br>Strength<br>(V/m) | Limit<br>(V/m) | Result |
|---------|--------------------|--------------------------------|------------------------------|----------------|--------|
| BLE     | 2402-2480          | 1                              | 0.97                         | 61             | Pass   |
| Wi-Fi   | 2412-2472          | 17                             | 6.13                         | 61             | Pass   |

**Note:**

The distance from observation point to the antenna is 20cm.

**Conclusion:** Compliant

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## **EXHIBIT A – EUT PHOTOGRAPHS**

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For photos in this section, please refer to report No.: DG1220704-29964E-02A1 EXHIBIT A.

# DECLARATION LETTER



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## DECLARATION OF SIMILARITY

Date: 2022-07-04  
 To Whom It May Concern

Dear Sir or Madam:

We, Shenzhen Sonoff Technologies Co.,Ltd., hereby declare that product: SONOFF SwitchMan Smart Wall Switch, The model M5-1C-80W, M5-2C-80W,M5-3C-80W, M5-1C-80G, M5-2C-80G, M5-3C-80G are electrically identical with the model: M5-1C-80 ,M5-2C-80 ,M5-3C-80 which was tested by BACL(Dongguan) with the same electromagnetic emissions and electromagnetic compatibility characteristics.

The following is a description of the differences and declaration similarities between several configurations.

| Model     | Color  | Relay                | Gang(s) | PCB Board          |   |
|-----------|--------|----------------------|---------|--------------------|---|
|           |        |                      |         | Power supply board | RF&Control Board  |
| M5-3C-80  | black  | Relay 1#             | three   | Different from 2C  | Same<br>(The RF part of the 3C series model is the same as the 2C series and 1C series models, but the PCBA of the control board is different.) |
| M5-3C-80W | white  | Relay 2#             |         |                    |   |
| M5-3C-80G | golden | Relay 3#             |         |                    |   |
| M5-2C-80  | black  | Relay 4#             | two     | /                  |   |
| M5-2C-80W | white  | Relay 5#             |         |                    |   |
| M5-2C-80G | golden |                      |         |                    |   |
| M5-1C-80  | black  | Relay 4#<br>Relay 5# | one     | Same as 2C         |   |
| M5-1C-80W | white  |                      |         |                    |   |
| M5-1C-80G | golden |                      |         |                    |   |

The difference of the relay is described as follows:

| Components | Manufacturer                                 | Type/Model     | Technical Data  |
|------------|--|----------------|-----------------|
| Relay 1#   | Shenzhen Golden Electrical Appliance Co Ltd. | Y5-1A -5DH 5DH | 5A 250VAC       |
| Relay 2#   | Zhejiang Fanhar Electronics Co., Ltd.        | W18-1AST-DC5V  | DC5V 5A 250VAC  |
| Relay 3#   | SUZHOU GEEKO ELECTRICAPPLIANCES CO.,LTD      | GK101-1AS-DC5V | 5A 250 VAC      |
| Relay 4#   | Shenzhen Golden Electrical Appliance Co Ltd. | GI-1A-5LH      | DC5V 10A 250VAC |

|          |                                       |                    |                 |
|----------|---------------------------------------|--------------------|-----------------|
| Relay 5# | Zhejiang Fanhar Electronics Co., Ltd. | W11-1A2STLE-H-DC5V | DC5V 10A 250VAC |
|----------|---------------------------------------|--------------------|-----------------|

Except the differences above, we declare the products are electrically identical. We guarantee all the information provided above is true, and notice that we'll bear all the consequences caused by any false information or concealing.

Please contact me should there be need for any additional clarification or information.

Best Regards,

Signature *Stan li*

Name: Stan Lee

Hardware Department Manager

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