

# RF Exposure Evaluation Report

**Applicant:** Ham-Let Singapore Valves & Fittings Pte Ltd

**Address of Applicant:** 1 Bukit Batok Street 22 #01-04/01-05 Singapore 659592

**Equipment Under Test (EUT)**

Product Name: IoT-COMMBOX-IoT MANIFOLD

Model No.: IoTHFEE

**FCC ID:** 2A3I5-HFEE

**Applicable standards:** FCC CFR Title 47 Part 2 Subpart J Section 2.1091

**Date of sample receipt:** 11 Feb., 2022

**Date of Test:** 12 Feb., to 03 Mar., 2022

**Date of report issue:** 14 Mar., 2022

**Test Result:** PASS\*

Authorized Signature:



Bruce Zhang  
Laboratory Manager

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the JYT product certification mark. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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## 2 Version

| Version No. | Date          | Description    |
|-------------|---------------|----------------|
| 00          | 08 Mar., 2022 | Original       |
| 01          | 14 Mar., 2022 | Updated page 7 |
|             |               |                |
|             |               |                |
|             |               |                |

*Tested by:* Mike.ou  
**Test Engineer**

*Date:* 14 Mar., 2022

*Reviewed by:* Winner Zhang  
**Project Engineer**

*Date:* 14 Mar., 2022

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## 4 General Information

### 4.1 Client Information

|               |   |
|---------------|---|
| Applicant:    | Ham-Let Singapore Valves & Fittings Pte Ltd           |
| Address:      | 1 Bukit Batok Street 22 #01-04/01-05 Singapore 659592 |
| Manufacturer: | Ham-Let Singapore Valves & Fittings Pte Ltd           |
| Address:      | 1 Bukit Batok Street 22 #01-04/01-05 Singapore 659592 |

### 4.2 General Description of E.U.T.

|                        |   |
|------------------------|---|
| Product Name:          | IoT-COMMBOX-IoT MANIFOLD  |
| Model No.:             | IoTHFEE   |
| Operation Frequency:   | 125KHz Channel: 902.3 MHz - 914.9MHz<br>500kHz Channel: 903 MHz - 914.2MHz    |
| Modulation technology: | CSS   |
| Antenna Type:          | Omni-directional antenna  |
| Antenna gain:          | 2 dBi   |
| Test Sample Condition: | The test samples were provided in good working order with no visible defects. |

### 4.3 Operating Modes

| Operating mode    | Detail description                                      |
|-------------------|---|
| Transmitting mode | Keep the EUT in continuous transmitting with modulation |

### 4.4 Additions to, deviations, or exclusions from the method

|    |
|----|
| No |
|----|

#### 4.5 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC - Designation No.: CN1211**

JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

● **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber and 10m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

● **CNAS - Registration No.: CNAS L15527**

JianYan Testing Group Shenzhen Co., Ltd. is accredited to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L15527.

● **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

#### 4.6 Laboratory Location

JianYan Testing Group Shenzhen Co., Ltd.

Address: No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, People's Republic of China.

Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info-JYTee@lets.com, Website: <http://jyt.lets.com>

## 5 Technical Requirements Specification in FCC CFR Title 47 Part 2.1091

### 5.1 Limits

The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

| Frequency range (MHz)                                   | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm <sup>2</sup> ) | Averaging time (minutes) |
|---|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| (A) Limits for Occupational/Controlled Exposures        |                               |                               |                                     |                          |
| 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 |                               |                               |                                     |                          |
| 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                       |

### 5.2 Test Procedure

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{P \times G}{4 \times \pi \times R^2}$$

Where:

S = power density

P = power input to the antenna

G = numeric gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the centre of radiation of the antenna

### 5.3 Result

| Frequency (MHz) | Maximum Output power (dBm) | Maximum Output power (mW) | Antenna Gain (dBi) | Antenna Gain (numeric) | Distance (cm) | Result (mW/cm <sup>2</sup> ) | Limits for General Population/ Uncontrolled Exposure (mW/cm <sup>2</sup> ) |
|-----------------|----------------------------|---------------------------|--------------------|------------------------|---------------|------------------------------|--|
| Lora            |                            |                           |                    |                        |               |                              |  |
| 902.3           | 18.73                      | 74.64                     | 2                  | 1.58                   | 20.00         | 0.0235                       | 0.60   |
| 907.8           | 18.09                      | 64.42                     | 2                  | 1.58                   | 20.00         | 0.0203                       | 0.61   |

**Note:**

1. Just the worst case mode was shown in report.
2. The output power refer to FCC ID: VPYCMABZ, report No. SHEM160900621801.

### 5.4 Conclusion

The device is exempt from the test and satisfies RF exposure evaluation.

-----End of report-----