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

2 Version

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

Tested by: Mike.ou ***Date:*** *14 Mar., 2022*

Test Engineer

Reviewed by: Winner Zhang ***Date:*** *14 Mar., 2022*

Project Engineer

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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 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^2)	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	*($900/f^2$)	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	*($180/f^2$)	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^2)	Limits for General Population/ Uncontrolled Exposure (mW/cm^2)
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------