

# MPE TEST REPORT

Report No.: SHE21110074-02BE

Date: 2022-05-11

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**Applicant** : NATHER Ventilation System Co.,Ltd.  
**Address of Applicant** : No. 2688, Xingping 1st Road, Pinghu  
Economic-Technological Development Zone, Jiaxing City,  
Zhejiang Province, China.

**Product Name** : Wireless Communication Modules  
**Model No.** : TCM-F401-W4  
**Sample No.** : E21110074-02#03  
**FCC ID** : 2A3VE-TCM-F401-W4S  
**ISED Number** : 28014-TCMF401W4S

**Standards** : FCC Part 2.1091  
RSS-102 (Issue 5, Amd.1-Feb 2021)

**Date of Receipt** : 2021-12-14  
**Date of Test** : 2021-12-20 ~ 2022-05-10  
**Date of Issue** : 2022-05-11

**Remark:**

*This report details the results of the testing carried out on one sample, the results contained in this report do not relate to other samples of the same product. 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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## 1 General Information

### 1.1 Testing Laboratory

Company Name	ICAS Testing Technology Services (Shanghai) Co., Ltd.
Address	No.1298, Pingan Road, Minhang District, Shanghai, China
Telephone	0086 21-51682999
Fax	0086 21-54711112
Homepage	www.icasiso.com

### 1.2 Environmental conditions

Temperature (°C)	18-25
Humidity (%RH)	40-65
Barometric Pressure (mbar)	960-1060
Ambient noise & Reflection (W/kg)	< 0.012

### 1.3 Details of Application

Applicant Company Name	NATHER Ventilation System Co.,Ltd.
Address	No.2688, Xingping 1st Road, Pinghu Economic-Technological Development Zone, Jiaxing City, Zhejiang Province, China.
Contact Person	WANG xiaomei
Telephone	+86-21-64345163
Email	wxm@nather.com.cn
Manufacturer Company Name	Tiitang Information System (Shanghai) Co., LTD
Address	Room 308, Building 1, No. 3888, Humin Road, Minhang District, Shanghai

### 1.4 Details of EUT

Product Name	Wireless Communication Modules
Brand Name	N/A
Test Model No.	TCM-F401-W4
FCC ID	2A3VE-TCM-F401-W4S
ISED Number	28014-TCMF401W4S
Mode of Operation	WLAN 802.11b/g/n(HT20)
Frequency Range	2400MHz ~ 2483.5MHz
Modulation Type	DSSS, OFDM
Antenna Type	PCB antenna
Antenna Gain	2dBi
Hardware version	V1.0

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<b>Software version</b>	0102010801
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Note(s):

All applicable tests as described in test case and measurement sections were performed on model TCM-F401-W4S

## 2 Maximum Permissible Exposure (MPE)

### 2.1 Limits

According to FCC Part 1.1307, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the commission's guidelines.

**TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)**

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposure</b>				
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
300-1,500			f/300	6
1,500-100,000			5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
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
300-1,500			f/1500	30
1,500-100,000			1.0	30

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

### 2.2 Assessment methods

Calculation Formula from FCC OET 65:

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

Where:

S = Power Density (mW/cm<sup>2</sup>)

P = Input Power of the Antenna (mW)

G = Antenna Gain Relative to an Isotropic Antenna

R = Distance from the Antenna to the Point of Investigation (cm)

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## 2.3 Test Result

Operation Mode	Frequency Range (MHz)	Max Conducted Power (dBm)	Antenna Gain (dBi)	Max EIRP (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
WLAN 2.4GHz	2400 ~ 2483.5	-17.81	2.00	0.0262	0.00000521	1.0	Pass

### Note(s):

For 300 – 1,500MHz: Power Density limit is  $f/1500$  mW/cm<sup>2</sup>

For 1,500 – 100,000MHz: Power Density limit is 1.0 mW/cm<sup>2</sup>

## 2.4 Conclusion

The Power Density at the position which is 20 cm far from the EUT is smaller than the General Population/Uncontrolled Exposure limit.

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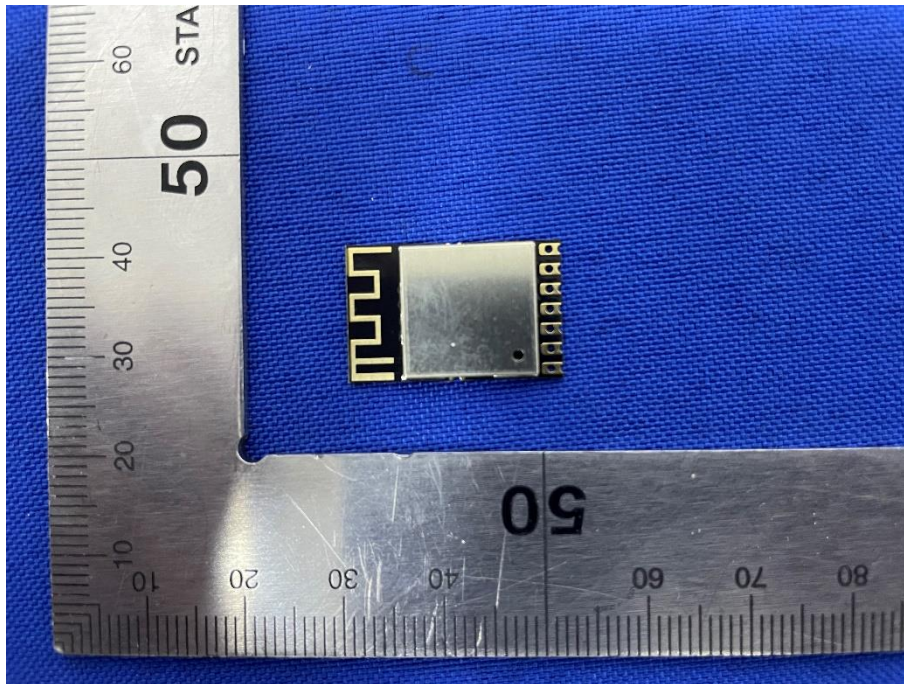
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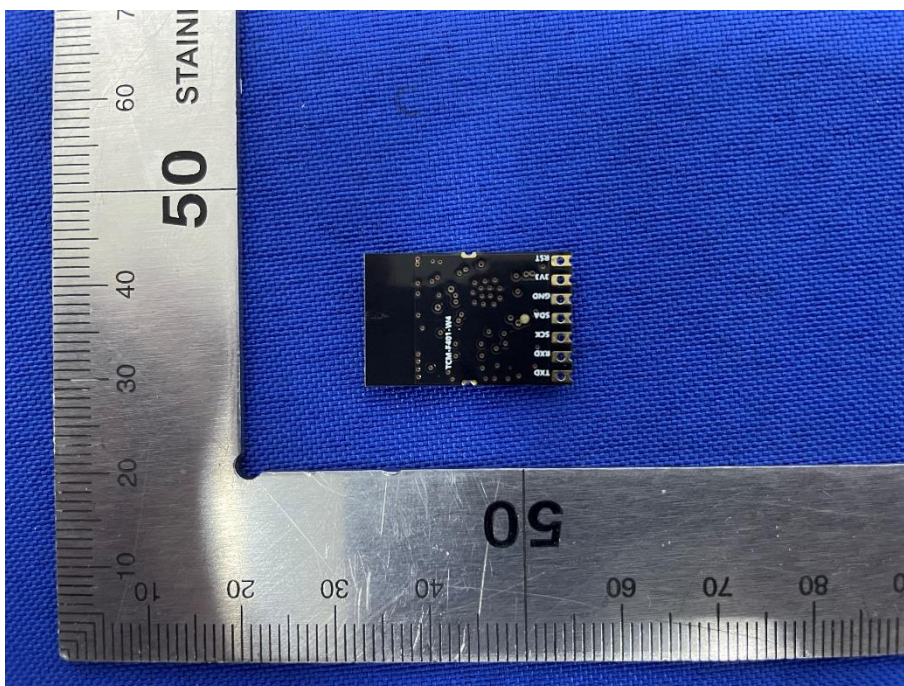
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## 3 Appendixes

### 3.1 Sample Photograph



Front of the sample



Rear of the sample

\*\*\*End of the report\*\*\*