

# TEST REPORT

Product Name : FF-T1\_Wireless pump

Model Number : FF-W-0005-002

FCC ID : 2A73O-FF-W-0005

Prepared for : FOOFEE INTELLIGENT MANUFACTURING TECHNOLOGY  
(DONGGUAN) CO., LTD.

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Report Number : ENB2205270024W01001R

Date(s) of Tests : May 27, 2022 to June 13, 2022

Date of issue : June 15, 2022

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## TEST REPORT DESCRIPTION

Applicant : FOOFEI INTELLIGENT MANUFACTURING TECHNOLOGY (DONGGUAN) CO., LTD.

Manufacturer : FOOFEI INTELLIGENT MANUFACTURING TECHNOLOGY (DONGGUAN) CO., LTD..

Trade Mark : N/A

EUT : FF-T1\_Wireless pump

Model No. : FF-W-0005-002

Power Supply : DC 5V

### Measurement Procedure Used:

FCC CFR Title 47, Part 15, Subpart B  
ANSI C63.4-2014

The device described above is tested by EMTEK (NINGBO) CO., LTD. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and EMTEK (NINGBO) CO., LTD. is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of EMTEK (NINGBO) CO., LTD.

Date of Test : May 27, 2022 to June 13, 2022

Prepared by : June Gao  
June Gao/Engineer

Reviewer : Ade Wang  
Ade Wang/Supervisor

Approved & Authorized Signer : Tony Wei  
Tony Wei/Manager



## Modified Information

Version	Report No.	Revision date	Summary
	ENB2205270024W01001R	/	Original Report



## 1. SUMMARY OF TEST RESULTS

EMISSION		
Description of Test Item	Standard & Limits	Results
Conducted Emission at Mains Terminals	FCC CFR Title 47, Part 15, Subpart B, Class B ANSI C63.4-2014	N/A
Radiated Emission	FCC CFR Title 47, Part 15, Subpart B, Class B ANSI C63.4-2014	Pass
Note: N/A is an abbreviation for Not Applicable.		



## 2. GENERAL INFORMATION

### 2.1. Description of Device (EUT)

EUT : FF-T1\_Wireless pump  
Model Number : FF-W-0005-002  
Test Voltage : DC 5V  
Modulation: ASK  
Operating Frequency : Receive:140-170 kHz  
Sample Number : 1#  
Number of Channels : 1 Channel  
Antenna Type : Coil antenna  
Antenna Gain : 0.0 dBi  
Temperature Range : -15°C ~ +50°C  
Date of Received : May 27, 2022

### 2.2. Input / Output Ports

Port #	Name	Type*	Cable Max. >3m	Cable Shielded	Comments
1	Enclosure	N/E	--	--	None
2	DC port	DC	No	Unshielded	None

\* Note: Use abbreviations:

AC= AC Power Port

DC= DC Power Port

N/E= Non-Electrical

I/O= Signal Input or Output Port (Not Involved in Process Control)

TP= Telecommunication Ports

### 2.3. Independent Operation Modes

#### A. Receive

## 2.4. Test Manner

Test Items	Test Voltage	Operation Modes	Worst case
Radiated Emission	DC 5V	Mode A	Mode A

## 2.5. Description of Test Facility

### Site Description

EMC Lab. : **Accredited by CNAS**  
 The Certificate Registration Number is L6666.  
 The Laboratory has been assessed and proved to be in compliance with CNAS-CL01:2018 (identical to ISO/IEC 17025:2017)

### Accredited by FCC

Designation Number: CN1302  
 Test Firm Registration Number: 436491

### Accredited by A2LA

The certificate is valid until May 31, 2023

### Accredited by Industry Canada

The Conformity Assessment Body Identifier is CN0114

### Name of Firm

: EMTEK (NINGBO) CO., LTD.

### Site Location

: 1F Building 4, 1177#, Lingyun Road, Ningbo National Hi-Tech Zone, Ningbo, Zhejiang, China.

## 2.6. Test Software

Item : Software  
 Radiated Emission : EZ-EMC (Ver. EMEC-3A1)

## 2.7. Description of Support Device

N/A

## 2.8. Measurement Uncertainty

Test Item	Uncertainty
Radiated Emission Uncertainty (3m Chamber)	: 4.06 dB (Polarize: H) (30MHz-1000MHz) 4.04 dB (Polarize: V) (30MHz-1000MHz) 4.82 dB (Polarize: H) (1~18GHz) 4.80 dB (Polarize: V) (1~18GHz)

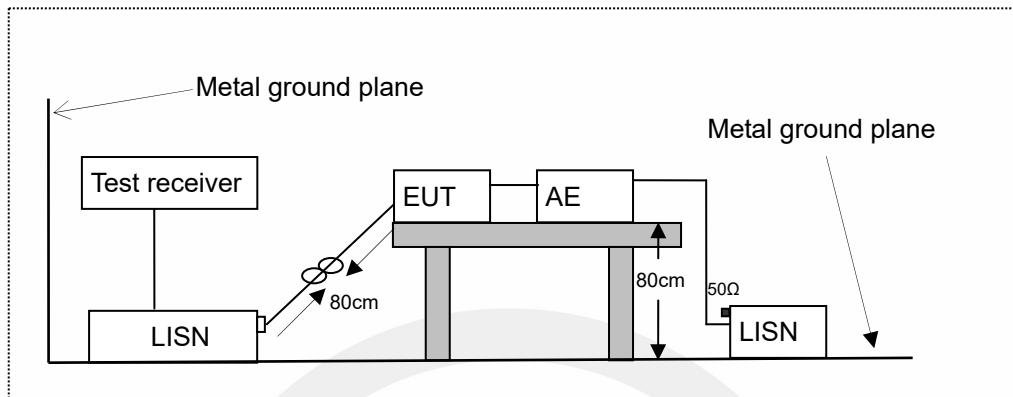
### 3. MEASURING DEVICE AND TEST EQUIPMENT

#### 3.1. For Radiated Emission Measurement

Equ. No.	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
ENE-002	Spectrum Analyzer	Rohde & Schwarz	ESCI	101107	July 08, 2021	1 Year
ENE-002	EMI Test Receiver	Rohde & Schwarz	ESCI	101107	July 08, 2021	1 Year
ENE-009	Pre-Amplifier	CD	PAP-0203	22015	July 08, 2021	1 Year
ENE-010	Bilog Antenna	Schwarzbeck	VULB9163	9163-467	July 12, 2020	2 Year
ENE-025-1	Cable	Huber + Suhner	CBL3-NN-0.5m	101216-2140500-2	July 08, 2021	1 Year
ENE-025-2	Cable	Huber + Suhner	CBL3-NN-3.0m	101216-2143000-2	July 08, 2021	1 Year
ENE-025-3	Cable	Huber + Suhner	CBL3-NN-9.0m	101216-2149000	July 08, 2021	1 Year

## 4. POWER LINE CONDUCTED EMISSION MEASUREMENT

### 4.1. Block Diagram of Test Setup



LISN: Line Impedance Stabilization Network

AE: Associated equipment

EUT: Equipment under test

### 4.2. Conducted Limit

FCC CFR Title 47, Part 15, Subpart B, Class B

Frequency (MHz)	Limit (dB $\mu$ V)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50 ~ 5.00	56.0	46.0
5.00 ~ 30.00	60.0	50.0

NOTE1-The lower limit shall apply at the transition frequencies.  
 NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

### 4.3. Test Procedure

The EUT was placed on a desk 0.8 m height from the metal ground plane and 0.4 m from the conducting wall of the shielding room and it was kept at least 0.8 m from any other grounded conducting surface. The size of the table will nominally be 1.5 m x1.0 m.

The rear of the arrangement shall be flush with the back of the supporting tabletop unless that would not be possible or typical of normal use.

All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units.

Connect EUT to the power mains through a line impedance stabilization network (LISN). Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

All the support units are connecting to the other LISN.

The LISN provides 50 ohm coupling impedance for the measuring instrument.

Both sides of AC line were checked for maximum conducted interference.

The frequency range from 150 kHz to 30 MHz was sweep.

Set the test-receiver system to quasi peak detect function and average detect function, and to measure the conducted emissions values.

Test results were obtained from the following equation:

Measurement (dB $\mu$ V) = Correct Factor (dB) + Reading (dB $\mu$ V)

Over (dB) = Measurement (dB $\mu$ V) - Limit (dB $\mu$ V)

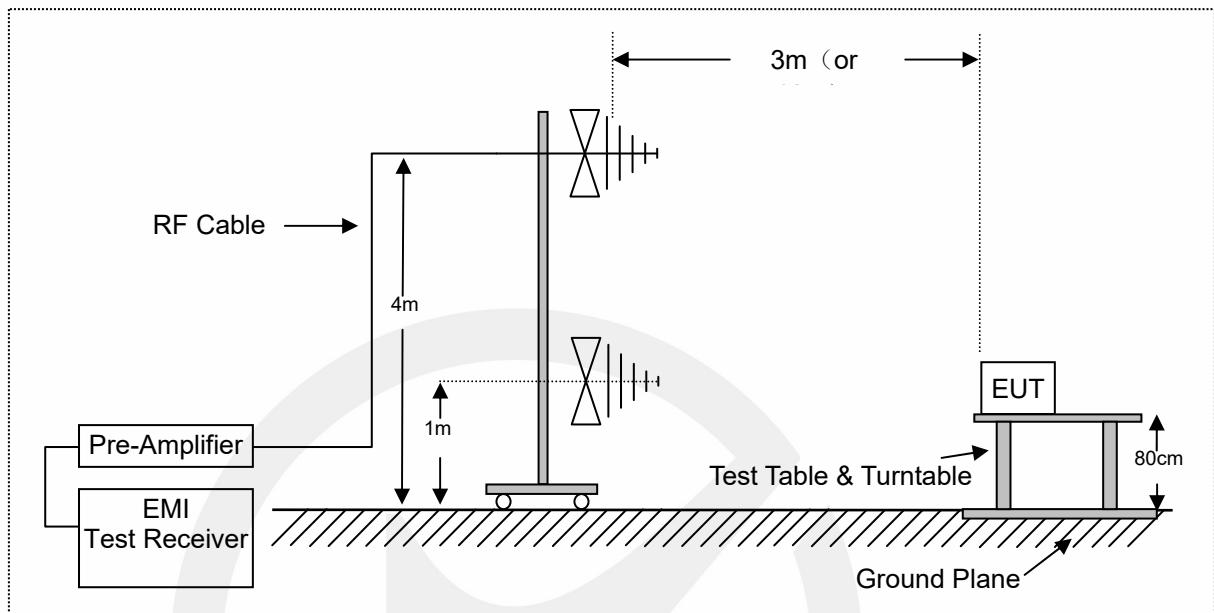
#### 4.4. Measuring Results

**N/A.**



## 5. RADIATED EMISSION MEASUREMENT(UP TO 1GHz)

### 5.1. Block Diagram of Test Setup



### 5.2. Radiated Limit

FCC CFR Title 47, Part 15, Subpart B, Class B

Frequency MHz	Distance Meters	Field Strengths Limit	
		$\mu$ V/m	dB( $\mu$ V)/m
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0

### 5.3. Test Procedure

The EUT was placed on a non-conductive table whose total height equaled 80cm. All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units. Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

The EUT was set 3 meters away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

The bandwidth of the Receiver is set at 120 kHz.

Test results were obtained from the following equation:

Measurement (dB $\mu$ V) = Correct Factor (dB) + Reading (dB $\mu$ V)

Over (dB) = Measurement (dB $\mu$ V) - Limit (dB $\mu$ V)

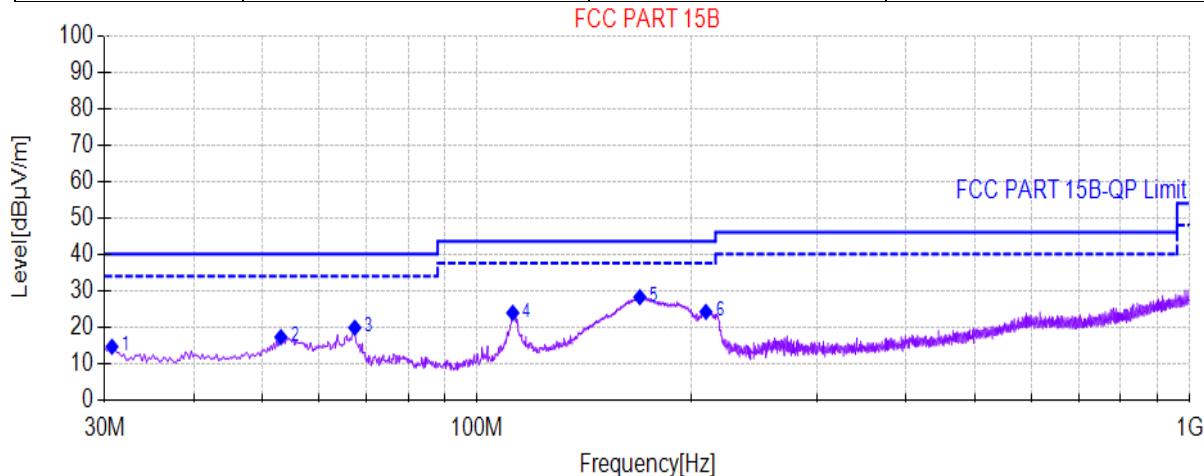
#### 5.4. Measuring Results

**Pass.**

Please refer to following pages.

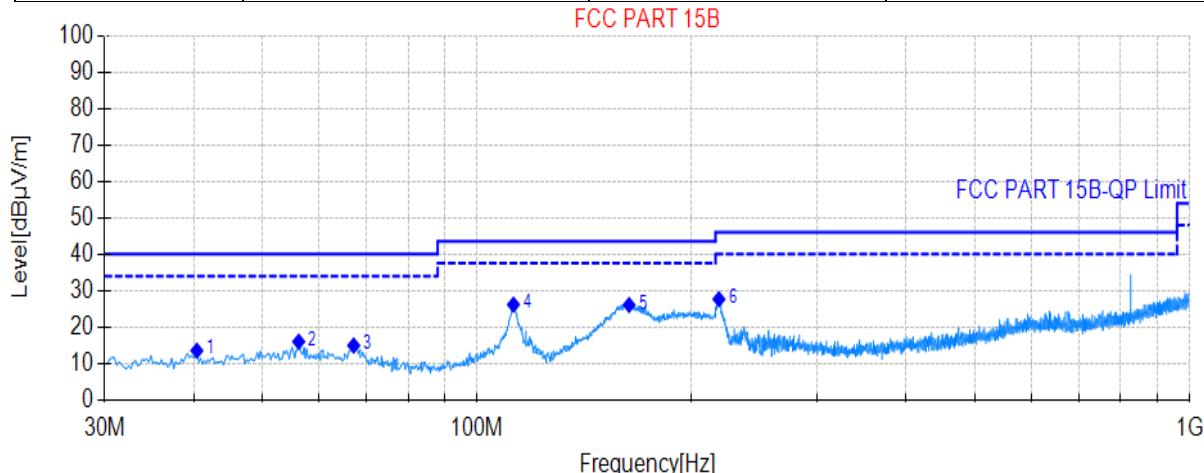


Project Information			
Mode:	Receive	Voltage:	DC 5V
Environment:	Temp: 25°C; Humi:60%	Engineer:	Alarak Wu



Final Data List										
NO.	Freq. [MHz]	QP Reading [dBμV/m]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	30.727	39.02	-24.46	14.56	40.00	25.44	100	296	Vertical	Pass
2	53.037	39.56	-22.34	17.22	40.00	22.78	100	316	Vertical	Pass
3	67.345	43.33	-23.54	19.79	40.00	20.21	100	356	Vertical	Pass
4	112.207	47.41	-23.53	23.88	43.50	19.62	100	302	Vertical	Pass
5	169.195	52.88	-24.68	28.20	43.50	15.30	100	356	Vertical	Pass
6	209.450	47.09	-22.93	24.16	43.50	19.34	100	280	Vertical	Pass

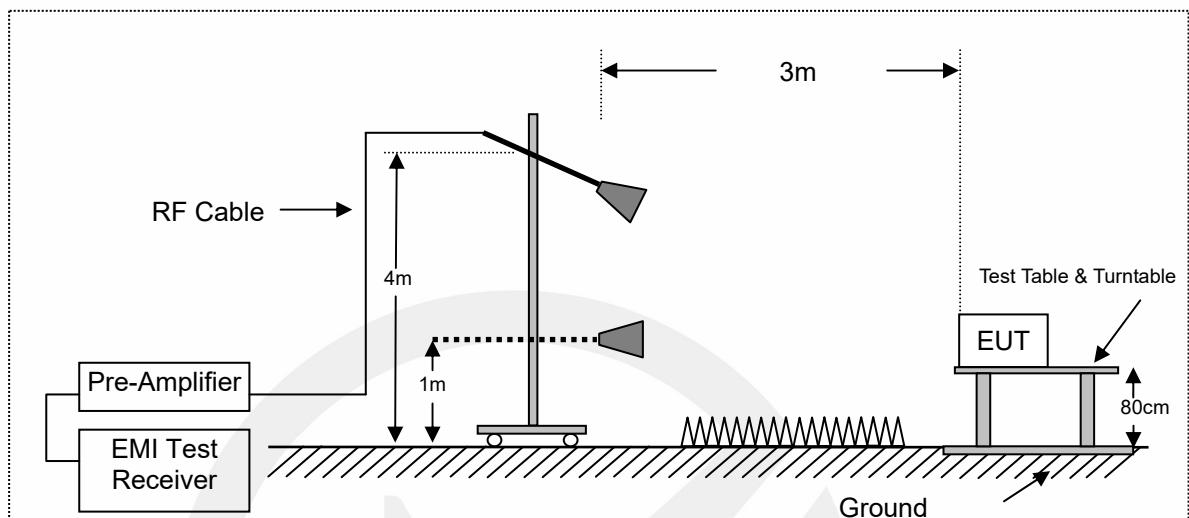
Project Information			
Mode:	Receive	Voltage:	DC 5V
Environment:	Temp: 25°C; Humi:60%	Engineer:	Alarak Wu



Final Data List										
NO.	Freq. [MHz]	QP Reading [dBμV/m]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity	Verdict
1	40.427	36.77	-23.26	13.51	40.00	26.49	100	356	Horizontal	Pass
2	56.190	38.31	-22.34	15.97	40.00	24.03	100	356	Horizontal	Pass
3	67.102	38.40	-23.48	14.92	40.00	25.08	100	338	Horizontal	Pass
4	112.450	49.70	-23.55	26.15	43.50	17.35	100	356	Horizontal	Pass
5	163.375	50.88	-24.83	26.05	43.50	17.45	100	340	Horizontal	Pass
6	218.422	50.30	-22.65	27.65	46.00	18.35	100	356	Horizontal	Pass

## 6. RADIATED EMISSION MEASUREMENT (ABOVE 1GHz)

### 6.1. Block Diagram of Test Setup



### 6.2. Radiated Limit

FCC CFR Title 47, Part 15, Subpart B, Class B

Frequency range GHz	Average limit dB( $\mu$ V/m)	Peak limit dB( $\mu$ V/m)
Above 1000	54	74

Note: The highest internal source of an EUT is defined as the highest frequency generated or used in the device or on which the EUT operates or tunes. If the highest frequency of the internal sources of the EUT is less than 1.705 MHz, the measurement shall only be made up to 30 MHz. If the highest frequency of the internal sources of the EUT is between 1.705 MHz and 108 MHz, the measurement shall only be made up to 1 GHz. If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz the measurement shall only be made up to 2 GHz. If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz. If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 40 GHz, whichever is less.

### 6.3. Test Procedure

The EUT was placed on a non-conductive table whose total height equaled 80cm. All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units. Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

The EUT was set 3 meters away from the receiving antenna that was mounted on a non-conductive mast. The antenna can move up and down between 1 to 4 meters to find out the maximum emission level.

The turntable can rotate 360 degree to determine the position of the maximum emission level.

The initial testing identified the frequency that has the highest disturbance relative to the limit while operating the EUT in typical modes of operation and cable positions in a test setup representative of typical system configuration.

The identification of the frequency of highest emission with respect to the limit was found by investigating emissions at a number of significant frequencies. The probable frequency of maximum emission had been found and that the associated cable and EUT configuration and mode of operation had been identified.

The frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with peak detector for peak values, and use RBW=1 MHz and VBW=10 Hz with peak detector for Average Values.

Test results were obtained from the following equation:

$$\begin{aligned}\text{Measurement (dB}\mu\text{V)} &= \text{Correct Factor (dB)} + \text{Reading (dB}\mu\text{V)} \\ \text{Over (dB)} &= \text{Measurement (dB}\mu\text{V)} - \text{Limit (dB}\mu\text{V)}\end{aligned}$$

#### 6.4. Measuring Results

N/A.



\*\*\* End of Report \*\*\*

## 声 明 Statement

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